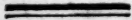


(2)

STRICTURES
ON A
NEW MODE
OF
BREWING, &c.



[PRICE THREE SHILLINGS.]

DEDICATION.

TO THE
RIGHT HONOURABLE
THE LORDS COMMISSIONERS
OF THE ADMIRALTY.

MY LORDS,

I HAD some years ago the honor to be called into the service of the Victualling, by an order from your LORDSHIPS Board, to attempt an improvement in the general System of Brewing. The heavy losses which had, for a series of years, resulted from unskilful practice, evidenced by condemnations, and great disappointments of supplies to the service, were grown to that alarming magnitude, as to awaken the fears of the then administration for the safety of his Majesty's fleets, particularly on account of the constitutions of the seamen suffering,

iv DEDICATION.

suffering, not only from the want of a regular supply of beer, but from the vitiated quality of such as was served to them.

How far I was enabled to remove those fears, effect a great national saving, and introduce some useful regulations, can be learned from the Journals of your Lordships House, and the Certificate granted me, of which a copy is annexed*.

I hold it a duty I owe your Lordships, to suggest my fears for the success of a NEW PLAN OR SYSTEM OF BREWING, now about to

* (Copy of Certificate.)

London, August 19, 1783.

*"We the Commissioners for Victualling his Majesty's Navy, do
"Certify, that MR. GEORGE BLAKE has, by the Directions of the
"LORDS COMMISSIONERS OF THE ADMIRALTY, been
"employed to introduce a NEW SYSTEM OF BREWING BEER, for
"the Use of his Majesty's Fleets: in which Service he has acquitted
"himself to our Satisfaction; the Qualities of the Beer brewed by him,
"being greatly superior to any we ever experienced before in the King's
"Brewhouses."*

JONAS HANWAY,
WM. LANCE,
J. SLADE.



DEDICATION. vii

to be introduced by your LORDSHIPS order; the ground of my fears, and the nature of my objections to the principles of this System, will appear from the following STRICTURES, which I have taken the liberty of addressing to your LORDSHIPS, as the Guardians and Governors of our Seamen; and therefore interested in providing for the health and comfort of that most generous, useful, and brave part of his Majesty's subjects.

I have the Honour to be

Your LORDSHIPS

Most obedient and humble Servant,

GEO. BLAKE.

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ADVERTISEMENT.

THE Author of the foregoing strictures respectfully informs the public, that he has invented an Hydrometer, that acts on such simple principles as to preclude the necessity of weights, which have been considered as both tedious and perplexing in their operation.

The purposes to which hydrometers in general have hitherto been applied in the brewery, have been confined merely to that of ascertaining the quantity of saccharine, or fermentable matter in worts; also the difference in the specific value that is found in malts; which, in many instances, amount to from 5, to 30 *per Cent.* This now offered to the public, not only possesses these advantages, greatly improved, but is also calculated for determining the extent of a vinous fermentation; a circumstance of the highest importance; and, it is presumed, not yet sufficiently attended to. The intelligent brewer will easily perceive the utility that must result from an improvement of this nature, which lead to a more uniform and successful practice, in brewing at all seasons of the year, than by any other method.

The success of brewing in summer, it must be confessed, has often been found extremely precarious. The author of this address is not a little flattered, in having it in his power to refer to the most respectable authorities of many gentlemen, in Great Britain and Ireland, who will bear ample testimony of the benefits they have received from him in this respect, as also to the certificate of the Honourable Commissioners of his Majesty's Victualling Office; in which service it was proved, that beers brewed under his immediate directions, during the hottest part of the summer, although of so light a body, as is that brewed for the Navy, has been found good after the expiration of twelve months.

It is certain, that every desirable effect that occurs to the brewer or malt-distiller, in their respective business, depends on a well-conducted fermentation. The operator having no certain guide, through this bewildering path, to a proper crisis, for cleansing, distilling, &c. often finds, in pursuit of the end proposed, doubt and uncertainty; also a very great dissimilarity, in the intrinsic value of his commodities. To remedy these evils, and establish a criterion, by which the whole may in future be regulated, this instrument is proposed as an effectual means. But it is necessary, in order to explain the various useful purposes, to which it is applicable for brewing Ringwood, Dorchester and Burton ales, porter, table beer, &c. to publish with it a Book of Instructions, by which will be demonstrated, from actual practice in different places, its general utility.

This new in-vented **HYDROMETER**, and Book of Instructions, together with an accurate Thermometer, packed in a mahogany case, sent, as *per* order, to any part of the three kingdoms, Price 4 *Guineas*.

N. B. Such gentlemen as may wish to attend the Author's practice in London, will be treated with on liberal terms. Letters, post paid, addressed to No. 15, Leicester Street, Swallow Street, will be duly attended to.

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PREFACE.

THE art or business of Brewing may be considered as of the first national consequence, not only in a commercial point of view, but as productive of that astonishing share of the public revenue, or supply, for the exigencies of the state, and exciting the greatest exertions for promoting agriculture. If viewed through the still more important medium of its being the source of that hale vigour, and corporeal strength, for which the inhabitants of this island are distinguished, particularly the labouring part of them, above those of the neighbouring nations, the cause of which has been ascribed, by men of the first medical reputation, to the use of malt liquor, these considerations cannot fail of inclining the ingenuous and well disposed to say, that man deserves well of his country, who extends or makes improvements in this noble art, and on the other hand, he ought to be considered as an enemy to his country, who shall, in any wise, impede, keep back, or interrupt

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the progress of advances in a business, with which the health, not only of a large proportion of the present inhabitants of the land, but probably of posterity, is nearly connected.

Again, If Brewing be considered, as in common, with other arts, likely to be promoted by men of long study and extensive practice; and if any man supposed to be of this description, has acquired reputation enough to be thought worthy of being consulted on any important point, touching improvements, alterations, new modes, or systems, that have, for their object, the advancement of the art, particularly where the public or government are more immediately interested, such a man seems to have a right to be heard fairly and candidly. And any reservation on his part ought to be looked upon as highly criminal, and not less so should it be discovered, that his reasoning and arguments are under the influence of prejudice, interest, partiality, or any other impulse but that of truth. A man who maintains opinions either of his own or others, the truth of which has not been sanctioned by proof or experience, and who
 refuses



refuses to yield to the force of reasoning or argument ; and he who will at once be tame enough to subscribe to the truth of principles or doctrines which he does not understand, to gratify the wishes of any man, or party, however dignified, are alike to be condemned, and are equally inimical to the advancement of truth and the good of society.

But that man, who is either actively or passively venal enough to sacrifice, or prostitute, his judgment at the shrine of interest or favour, becomes both an accomplice in, and accessory to, all the possible evil consequences that may result, either to the nation at large, or to smaller societies, and is unworthy of public confidence or private friendship.

Few trades or arts have been more sedulously studied than the Brewery for these last twenty years ; the practitioners therein had found to their cost and mortification, that uniform success (which in general fell to the lot of other professions, where the choice of the best materials was made the primary object) but seldom was found in the Brewhouse, which

awakened the attention of some of the most discerning among them, to search for the cause why a business of such national concern, and large private interest, should be left destitute of that clue or system of practice which might secure both the satisfaction and profit which other manufactories enjoyed.

Several attempts have been made by some of the sanguinary and enterprizing professors of chemistry to subjugate and lay under heavy contributions the whole province of the Brewer, leaving him not the least or most trifling part of his practice, the true and successful exercise of which must be attributed, according to them, to a competent knowledge of the chemical art; and many capital Brewers were amused with this specious intimation, and promised themselves great advantages by adopting new modes of practice, which were to be productive of profit exceedingly abundant, not only from obtaining by the first processes, a greater quantity of the essential qualities of their materials, but by a subsequent improved mode of treating the extract when under fermentation; the result, however, proved
contrary

contrary to their towering expectations, which inclined them, in their turn, roundly to assert that this usurpation practised on them by the chemists, was no more than a species of quackery, or new sort of alchymy; and could have nothing farther for its object than the extracting from their pockets large sums of money, in which some succeeded. But the brewers were not inclined to contend with the chemists about the admissibility of their claims.

That brewing is an act of chemistry they readily admit, but this they consider is admitting no more than what may be said of divers other arts and trades, some of which it might probably be offensive to the delicacy of the chemists to mention. Their interference has however been productive of one very sensible and important effect, which is to convince the brewer of the dignity of his calling, by shewing him to what a respectable body he stands related. Besides, if he be not negligent or inattentive, he may profit much by this intimation; for it has been incontestably proved that a brewer by close study and application, may be a chemist; but that a chemist,
however

however eminent, cannot be a brewer, until he will condescend to quit his laboratory, and attend the malt and brewhouses for some years, and, with unremitting care and attention, observe the different effects of different modes of treating the same materials, throughout all the various processes, both of malting and brewing; the very great dissimilarity there is found in the qualities of barley and hops, the produce not only of different countries or kingdoms, but of the same field or plantation in different seasons; and learn from thence the best method of treating them respectively at all seasons of the year, and under all the possible circumstances that may occur.

When also they shall, during their absence from the laboratory, have discovered that the business of fermentation, on a large scale, is something more than they could possibly have learned there, and that its wonderful effects can be no where so well discovered as in the brewhouse or distillery, the professor may then return to his laboratory, instructed and deemed worthy of being admitted an honorary member of the Society of Brewers; and his
knowledge

knowledge being improved, he may with great propriety come forward and give lectures and lessons with credit to himself and profit to his pupils. Let me add, that the brewers in general hold the professors of chemistry in high estimation; but will not submit to be totally guided by them.

Till the happy period shall arrive that chemists will condescend to become brewers, or that brewers shall become skilled in chemistry, the latter must content themselves with walking in their old, humble path, unassisted by the refined ideas or learned theories of the chemists, and can only comfort themselves with the hopes, that by persevering in the course of their vulgar practice, and in such measures as experience has taught them, will prove a security against those misfortunes which some have described, as if more fatal in their consequence than all the evils which are fabled to have proceeded from Pandora's box.

The author of the following strictures is quite at a loss to determine, what the gentleman is, whose system of Brewing he feels himself

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compelled to give his sentiments upon; whether he be a chemist by profession or not, he cannot say; but as a philosopher he must consider him, and one not of the ordinary class; or if a mechanic, he must be of a superior order; for the wonderful system he has exhibited as the means of accomplishing the proposed improvements in brewing, is described in such a manner as plainly to indicate it to be the production of a genius not to be found in men of low education and confined ideas.

To a man of such distinguished endowments, I can only look up with admiration and must content myself with having been so fortunate as to be enlightened by several of his ingenious remarks; but it is unnecessary to add, that those remarks were not the occasion of the following strictures.

The reader is requested particularly to take notice how little foundation there ever was for an intimate friendship, such as has been said to be subsisting, betwixt Mr. Long and me, and which, by refusing to countenance his principles, at the expence of the prostitution of my

my judgment, I have been charged with violating; and in consequence have drawn down upon myself the whole weight of his vengeance, and, no doubt with it, that of several of his advocates and patrons. To avoid the dreadful effects of which resentment, I appeal to a generous public, so far as respects their candid sentiments of the matter. I am not ambitious of fame, nor have I the most distant idea that the public ought to interfere farther in a speculative business; but feeling, as I do, the necessity of rescuing my character from an imputation, which I cannot be silent under, must beg it may be considered I could have no interest in dissenting from this gentleman's opinion; but on the contrary have forfeited all right to any of the emoluments I might derive from a more complying conduct; and may henceforth consider myself as exposed to all the artillery of this extraordinary genius's resentment, for daring to differ from him in opinion, or for refusing to swallow the gilded pill he offered me. It will be easily perceived that, as at the time of writing my remarks on the system to the Victualling Board, I had no idea of publishing them; some inaccuracies

of language may be found, which I had no time to correct, and indeed there will of course be many in the present publication ; for I neither aspire to nor am solicitous about the reputation of classical elegance, but truth and a knowledge of the subject derived from experience; and cannot but think myself justified in attempting to shew the fallacy of Mr. Long's reasoning: and that having fully proved, that the principles which he lays down in several cases are false, I am not afraid to risk my reputation by intimating that the whole of his theory is visionary. I am truly concerned for the deception that has been practised on the Victualling Board ; and if they have been advised by professional men to adopt his expensive scheme, I am still more surprized that such men did not see that the whole of the system was unfounded, being in no one instance supported by matter of fact.

Such is my opinion ; and I hope, after perusing the following sheets, it will not be said I took it up rashly. In stating facts I have adhered literally to truth ; I have reasoned on those facts as well as my slender abilities would permit ; and now refer the whole to the censure of the reader.

THE
LETTER AND REMARKS
ON
MR. LONG'S
NEW MODE OF BREWING,
LAID BEFORE THE VICTUALLING BOARD.

TO THE
Honourable Commissioners of the
VICTUALLING BOARD.

HOW much soever my pride as a professional man might be hurt at the idea of having that province, in which I have laboured near 30 years, invaded by a gentleman, who professedly comes forward destitute of the

knowledge of even the first principles of brew-
 ery ; I could not but be anxious to learn on
 what ground his system was formed, more espe-
 cially as I found a Patent had been taken out,
 and that he was patronized by so respectable a
 body of gentlemen as yourselves ; and also
 countenanced, not only by the principal malt
 distillers in and about London, but likewise by
 some of the eminent brewers. My first effort
 for gratifying this curiosity, was in the usual
 mode of applying for a sight of the said patent
 or specification thereon, but this source of in-
 formation failed me. My next step was to
 obtain an interview with the author, if happily
 I might find him. To this I was the more
 encouraged, as having had a few hours conver-
 sation with him in Dublin, previous to his em-
 barking for England ; at which time, he gave
 me some intimation of his intention to apply
 for a Patent for an Improved System of Brew-
 ing ; and pressed me hard for a continuation of
 our acquaintance, or friendship. Perhaps he
 considered me as a public character, and, as
 such, likely to promote his interest in the above
 business ; though he at that time gave me not
 the least idea what his system consisted of.

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In order that we might the better cultivate the proposed friendship, the night he left Dublin, he gave me his address in London, at Anderton's coffee house. There, on the evening I arrived in London, I went to enquire, but could hear nothing of him; and at different times since made several fruitless enquiries; but afterwards, at the time I tried for a sight of his Patent, which was on Thursday the 10th of Feb. 1791, I found his lodgings, at No. 11, George-street, Adelphi. He seemed overjoyed at the fortunate event of our meeting, said he had long wished to see me; and as he was now circumstanced, declared he was determined to introduce me as *his* brewer, into the king's business; adding not a man in the kingdom should be trusted besides myself. How flattering soever this might at first appear, I was still in the dark about the grounds on which his great improvements were to be formed. But on the Saturday following, he gave me his manuscript Pamphlet, containing the whole of his system, desiring that, after having perused the same, I would write to the Board, to approve, if I could, of its principles; and this was to serve, as a means of my being introduced

introduced into his employ. I had his Pamphlet
 but a few hours before I returned with it,
 and intimated to him my not being satisfied
 therewith, and stated some objections, which
 he attempted to explain away; but by no
 means did. Our conversation was interrupted
 by company; and a stop being then put to
 the business, I left him. Not long after
 I parted from him, I mixed with a com-
 pany, where this very business was made a
 principal topic of discourse; and when it was
 understood by one of the company, who was
 my particular friend, that I had formed some
 acquaintance with Mr. Long, it was pressed hard
 on me, as a duty I owed my reputation and
 family, immediately to withdraw myself from
 any further connection with him, as it might
 greatly endanger my name and character as a
 brewer. I replied, that my situation might
 thereby become truly critical, more especially
 in regard to the Board, to whom I was under
 obligations. Thus the affair was in every re-
 spect very unpleasant: it was however at last
 thought adviseable to communicate the busi-
 ness in as brief a manner as possible to the
 chairman of the Victualling Board, in order
 that,

that, if in future Mr. Long should advert to my name, as in any way abetting his plan, I might have an opportunity by that means of being exculpated. This step I pursued; but the chairman made a very unexpected use of my intimation, desiring my attendance at the Board on Thursday the 17th. When I appeared before them, I met Mr. Long, who attended at the same time, and from him received some treatment inconsistent with the character of a genteel man, such as I took him to be. In conclusion, I was desired by the

Board to give my sentiments on Mr. Long's system in writing; which I did in the following remarks; but as they do not contain all I had to say, having been hastily written in obedience to the injunction laid upon me by the Board, I shall enlarge farther on the several Articles in the subsequent Strictures.

23d Feb. 1791.

REMARKS

R E M A R K S

*On a Proposal for introducing a New
Mode of Brewing, by — Long, Esq.
from Dublin.*

ON HIS INTRODUCTION.

THIS beautiful piece appears to have suffered materially in the concluding part, which seems very unequal to the beginning. Mr. Long sets out with delineating in a lively and striking manner, the limitations which Providence has set to the powers of the human mind ; shewing how infinitely short of perfection the most enlightened of men are found to be, and the slow but progressive advances of science and art, in general ; but with a truly generous concern for the fatal neglect which has for a century

tury past been evidenced in the brewery, which it seems has received little or no culture ; he proceeds to remark generally, (and very properly) that many and great obstacles stand in the way of improvement ; blind prejudice for traditional custom, and obstinacy, of the most inveterate kind, which even repels conviction : such it seems are the brewers in general, considered by this writer, who appears to have taken no small pains to convince them, that the system to which they are wedded, is founded in ignorance and darkness, and that the better one which he recommends is a perfect, or complete, system ; some have gone so far as to say, that Mr. Long, after having owned that perfection is not the lot of human nature, announcing himself as the author of perfection in this system, would have the world to believe him more than mortal ; especially when it is considered that he disavows any knowledge of the business from actual practice. I shall not take up the time of the Board by animadverting farther on his introduction, except to remark, that it is in general considered, no business has received greater improvement than the brewers within these last 20 years ; nor are there in my opinion

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among

among the professors of any of the arts, men of more liberal sentiment, if not of the most enlightened understanding, and probably there may be many among them men who, like myself, will not readily yield their assent or subscribe to the truth of such new doctrines as are contained in the following articles. But before I enter upon the unpleasing task of reviewing them, must first observe, that all must be compelled to acknowledge the truth of one of the gentleman's remarks, that the brewing business is a series of operations in chemistry, a competent knowledge of which art they must also necessarily admit to be useful; but this will never be allowed as the only clue or qualification for brewing, any more than to be a cook, notwithstanding the boiling of potatoes, or any other vegetable production, comes in for a share for the chemical art. I now proceed to the discussion of the several Articles.

ARTICLE

ARTICLE THE FIRST.

Mr. Long alludes to the mode adopted for making malt as an erroneous one ; on this ground, that the course of vegetation attempted to be brought round thereby is inadequate to the purposes of producing good malt, merely because no attention is paid to the discriminating betwixt the several qualities of the grain previous to its being committed to the cistern for that purpose, pointing to two, three or four different kinds, the production not only of different fields or countries, but from one and the same field ; and that the attention of the maltster should be directed to the classing them out respectively, or culling them for the end of differently treating them in the process of malting. What the mode of culling may be which he means to recommend, I do not remember he has touched on ; but had he attended properly to the matter, he must have discovered that nature in this respect has not differed from her ordinary mode of working throughout the whole of her productions, in both the vegetable, animal, and, if he please, he may add, the rational world ; that is, that there are innumerable instances in which the

smaller bodies are found to possess equal, and often superior, quality to many larger ones of the same species. For example, smaller animals, a greater share of vivacity or spirit; smaller men, a greater portion of intellectual capacity. If this remark does not in general and in all cases hold good, I speak however from actual knowledge, that it will apply to the subject now under consideration, that as there are to be found in all barley, some corns very inferior in size but vastly superior in quality to some others, which yet will take the same time to compleat the germination as the large ones, and if it was found practicable to separate them for the purposes alluded to, the end would be defeated by the means.

ARTICLE THE SECOND.

The author's opinion and mine are in exact unison in this respect, having found by experience near 20 years ago, that I could draw off the worts much quicker and dryer, from malt bruised than from what has been ground: the reason rollers are not brought into more general use is, because every situation will not admit

admit of the machinery which is necessary for the purpose.

ARTICLE THE THIRD.

I find it nearly impossible to agree with the author in any part of his remarks under this Article: whatever ground he might have to charge the malt distillers, with an error in putting on their liquor too hot, he should have spared the brewers, until he had learnt that the first article in their creed, is to adapt the heat of the first liquors to the malts, as they shall appear capable of bearing, consistent with the purposes and intentions ultimately to be obtained in the quality of the beer; and that on the heat first given the liquor, applied to the malt, depends principally their success; for an error committed in this first process, can scarcely be remedied by any subsequent treatment, and consequently the brewers cannot admit of a partial or increased heat being given to the mash tun, while the extract is forming; for he has less to fear from a decrease of a few degrees than from the contrary, which, communicated in the manner proposed, must
operate

operate in a very violent and partial manner, and it would be of less moment to him, if he was compelled to suffer a loss of part than to endanger spoiling the whole; but I believe few, if any, has experienced the truth of the author's position in this respect, by having much of the essential quality of the malt in their goods.

I totally despair of ever being converted to the belief of that doctrine, contained in the author's paragraph, under this head, wherein he says, that the first liquors by adhering to his rules might, with the greatest safety, be used from 20 to 30 degrees lower than usual; and must also protest against the admitting of a heat of 208.

Were I to admit of the principle, which I by no means do (save that any method which would preserve an equable heat, while the extract is forming, would be a pleasing acquisition) I could not conceive that the means of accomplishing it, proposed by the author, would prove effectual: but as I confess myself not competent to judge how the tubes are to be
con-

conveyed into the tun, whereby every part of the mash shall at the same instant receive the salutary effects of the warm liquor ; and as I am equally ignorant of the method how the large metallic plate at the side or bottom of the tun, made fire proof, can produce the same effect with safety, I will not trouble the Board with any further remark on either of those manoeuvres.

ARTICLE THE FOURTH.

The author continues with that politeness that he is distinguished for, to lead us on, step by step ; and now excites our attention to one of the most formidable evils, by his account, that can assail the brewhouse, described as the source and origin of most, if not all, the ill flavours that malt liquors are often found to possess. I will not contend with the author for the non-existence of evils that are sometimes produced by suffering the worts to lie too long in the under back ; but must say that they rarely have occurred, at least where I have been concerned ; and must farther remark, that from my personal attendance on the Burton, Dorchester and

and Ringwood breweries, where no more than one copper is employed, and their worts perhaps in some instances brought precisely into the dangerous situation described, and that no ill effect has resulted from it, at least none that has come under the power of the senses to detect. However, such as have been conversant with drinking the ale above alluded to, will admit that their celebrity does not consist with being repleat with those ill flavours which the author mentions ; but if he has anticipated advantages by his proposed mode of setting aside the use of the under-back, which the brewer has never yet experienced, it becomes every one who is solicitous to make the most of his trade, or to excel in his commodity, to attend to it.

I am so far from an opinion that the means proposed for removing the above supposed evil, will lead to the introducing any imaginary good, that I suspect the very contrary effect ; for to me it appears altogether inconsistent with the very nature of things to commit a wort, which in this state has received no help or assistance from the restraining quality of the hop, to
commit

commit it to the refrigerator, and almost instantly to reduce it, perhaps, from 150 or 160, down to 50 or 55 degrees of heat; so great a shock or fall in this, its infant state, I should tremble for the consequence of; and as I disavow the principle, it will not be necessary on this head, to treat of the means, viz. how the machinery is to be applied, which appears to be of so complex a nature, with cisterns, cocks, pipes, refrigerators, pumps, &c. as wholly to bewilder one of my shallow capacity; one thing I was happy in being fully able to understand, which was, the author's concluding remark, that all vessels, receiving a running fluid, must be placed lower than those from which the stream proceeds: a very fortunate discovery.

ARTICLE THE FIFTH.

This article opens with an account of the average time given for the boiling of hops, though the author seems to have been misinformed, (if his knowledge be from hearsay only) as to the real average time, which he makes 2 hours and upwards, whereas it is in most instances near six hours; however, this he

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will

will say makes the more room for his improvement, which is proposed to extend to the saving of 25 per cent. or upwards, by preventing the escape of the most valuable part of the subject by boiling, which he proposed to effect by not boiling at all, at least not more than 10 minutes. I admit with him that the essential oil of some, but not all, vegetables, does fly off at the boiling point; but I a little suspect, in this instance, it will scarcely come up with the full meaning of essential oils, to assert that that fine fragrant quality, which exhales from the hop during its boiling, or perhaps at a lower degree of heat, and which many ingenious men have tried, but in vain, to save; I say its volatility is such; and so little attached to the other parts of the subject, that however it may be admitted as an essential part, like every other aromatic subject, is in one continued state of dissipation from the time of their first picking, throughout every period of its existence. How much soever there may be in these remarks, I will not affirm; but surely we may appeal to the testimonies of our own and others senses, who have attended to the qualities of such hops that have been kept for a year or upwards,

upwards, which exhibit no signs of the presence of this fugitive principle, more especially if they have been kept in an airy situation; however, if it be a singular sentiment of mine, though I hope this remark on the constituent or essential principles of hops has some foundation in truth, I will chearfully bow to better judgment; but admitting that infusing or soaking them for a day or more, before they are used, for the purpose of detaching from the rest, those lighter and more volatile parts, be a good practice, which I am inclined to favour, I cannot be a friend to the mode of doing it with hot water, as alluded to by the author; for if the heat of the atmosphere, together with the action of the air, be found sufficient to deprive them of this treasure, how much more shall the combined powers of fire and water, carried to a heat of 175, and from thence up to 212; and this too, after having been expanded and digested in a more moderate state of heat for 12 or 14 hours before? I say how much must these circumstances tend to provoke so subtle and capricious a subject as is that now under consideration? If not to depart wholly from the other component parts by evaporation,

poration, to form new arrangements, and run into new combinations. That these suggestions are not altogether hypothetical, must occur to every one who has at all attended to the change that is brought about by every culinary operation in the taste, smell, and every other characteristical property of all vegetable subjects, by being long exposed to the fire; this leads me to remark under this article, the mistaken opinion of the author respecting his saving of one barrel in the score, by not boiling his worts longer than from 15 to 20 minutes. I am compelled to acknowledge that there are separated from every vegetable and animal substance, or subject, while boiling, a certain effluvia peculiar to the said subject; but of that extreme rariety, as not to be brought under the cognizance of any of the senses, except those of smelling, and that not universally, or from every vegetable. Malt, which has gone through a species of fermentation, so far as to decompose its original constituent principles, has by that means been conducted forward to be fit for that process called brewing; by which its saccharine quality is intended to be wholly dislodged from its barky tenement, and then committed

committed to the copper for boiling; while under that operation, no other smell is found to issue from it than what is to be perceived to proceed from common sugar boiled in water; and, like that, obstinately refuses to yield to any attempt that may be made to lessen its gravity by boiling; for after repeated trials which I have made both in town and country, to find out if any loss in this respect was suffered by boiling a quantity for any length of time, even till it has been reduced to a third, fourth, fifth, or sixth part, the result has uniformly confirmed me in this truth, that not the least loss has been sustained; for after introducing the same quantity of water, which has been found to have evaporated, I have perceived that the gravity by the hydrometer has been what it originally was. These experiments have not been made but with a strict attention to the true temperature of the fluid by the thermometer bringing it to the exact state it was in before boiling: the force of conviction, in these experiments, has been so powerful as not to leave me a doubt of the truth, which is, that no saving of the essential quality of the malt will be occasioned by shortening the time
of

of boiling or cooling; that a change of the quality of the constituent principles of the malt is made by boiling, I must admit; but we, as brewers, are mostly fond of believing that it is a favourable change, not an injurious one, by continuing to a longer period than is specified in the author's system, who is silent about his motives for boiling at all; besides that of saving a loss, which, having been already treated of, I am of course led to his

SIXTH ARTICLE.

The matter treated of under this article bears a great resemblance to that of the preceding one, differing only by treating more on cooling: that there are benefits arising from quick cooling, I readily admit; but the benefits which I conceive to be derived therefrom, are materially different from what the author strenuously contends for; his being confined merely to that of saving of the essences of the hop and malt; but mine, those of preserving the wort, which by continuing too long in a warm state might run into a premature fermentation, which, in whatever degree

degree it is suffered to take place, will certainly injure that fermentation which is the brewers interest to cherish. Much need not be said on this head, as notwithstanding my admitting of quick cooling as an improvement, I have not intimated that the author's mode of refrigerating, will be found adequate to the proposed improvement. My doubt, on this point first arose, chiefly, from the vast quantities of cold water which would be found necessary for his purpose; but I have now more fully calculated that matter, and find that every tun of beer will require at least 5 tuns of cold liquor or water to bring the wort from 212° , or a boiling state, to the temperature of 65 , reckoning the water at 55 degrees by Farenheit's thermometer; but what effect this sudden change from extreme heat to cold, may produce on the quality of the worts, I will not attempt to say; nor have I ever been able, since the first intimation of the subject, to conceive how the works can be adapted to such a plan, either on a large or small scale; nor can I conceive but that it must necessarily be attended with a great deal of difficulty if at all practicable.

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THE SEVENTH AND LAST ARTICLE.

Displays to us the author's great knowledge of the management of the working tun, and a reference made to circumstances of great loss, which frequently happen to brewers who are destitute thereof in warm weather. My experience in most of the principal breweries in England out of London, has not furnished me with many instances of this kind; and when any brewery is erected under my immediate direction, I cause the tuns to be placed in as temperate a situation as possible, where excess of heat or cold shall not effect them; and I can produce instances of such as have adopted this method for upwards of 10 years, and actually brewed more in the summer constantly, than in the winter, being in a large trade in the country, without one accident of the above kind having ever occurred.

The plan of surrounding the tuns with a current of cold liquor in the summer months, if it can be done, will, I think, do no harm; nor am I apprehensive it will communicate much good; but that of conveying warm liquor

quor in pipes, through the tun in the winter, is to me the best part of the pipe scheme; not but that a much better plan might be and frequently is adopted, which does not act in so partial a manner; but it should be remarked that if the preceding system was to be adopted with a refrigerator, &c. and the working brewer be sufficiently instructed to manage them; if further, more tuns be made or placed in such a situation as the author describes, there can be but little danger of having his worts too cold. I have carried these remarks to a much greater length than I intended; but cannot conclude without intimating, that Mr. Long's summary conclusions, intituled "Observations," contain a full evidence of the truth of his assertion that he is no brewer; he is certainly consistent and in order, when he holds up the vast importance of conducting fermentation to a proper crisis; but how it will fare with his young and tender charge, after being exposed to the severity of the torrid and frigid zones, or, in other words, what effect the bringing of any subject, more particularly a fermentable one, through the different changes prescribed by the author's plan, in so instantaneous a manner, is what I could not pledge

an opinion on; but if I was tempted to declare which side my mind inclines to, I must say it was on the doubtful; and that the bringing the words sound to the tun, (which the author alludes to, as indicative of a good fermentation) will be rendered extremely precarious. I should, in short, remark, that several contradictions of the author's are to be found under this last head.



STRICTURES,

STRICTURES, &c.

The following is a literal Translation of Mr. Long's Manuscript, laid before the Honourable Commissioners for Victualling his Majesty's Navy; and some eminent Brewers in London; which the Author of these Strictures will take the liberty of commenting on, at the different Paragraphs, as to him shall appear most Striking.



“ For the Perusal of the Honourable
 “ the Board of Commissioners for
 “ Victualling his Majesty's Navy.”

“ TO arrive at perfection is not the lot
 “ of human nature; yet let us not repine
 “ at the dispensations of providence, who has
 “ wisely, and wonderfully, ordered the hu-

“ man fabrick, whose endowments are so
 “ justly proportioned, that in his distribu-
 “ tions, it rarely happens, that one, in point
 “ of sense and faculties, can claim a superi-
 “ ority over another, and to me it is one of
 “ the most cogent, and forceable instances
 “ of the wisdom and goodness of the Creator,
 “ towards his creatures; that arts and sciences,
 “ as well necessary, as ornamental, can never
 “ in a moment, or from the most collected,
 “ and puissant efforts, of an individual, re-
 “ ceive that refinement, or arrive at that state
 “ of utility, and universal benefit, which the
 “ latitude of the human understanding is
 “ found capable of imparting; were this the
 “ case, the main spring, the stimulus of action,
 “ would be lost; the mind of man, must, in
 “ the end, become torpid and sluggish for
 “ the want of matter to employ its operations
 “ on; and a mental langour, and indifference,
 “ pervade all ranks in society. But it is
 “ ordered, and wisely ordered, otherwise;
 “ for, which of us can point out the art, that,
 “ since its birth, has not received cultivation?
 “ Which of us can point out the science, that
 “ has not been found susceptible of improve-
 “ ment?

"ment, the accumulated wisdom of man-
 "kind, and the experience of ages, have
 "been found inadequate to the arduous task
 "of improving to the utmost, though attend-
 "ed with laborious research, painful and
 "tedious experiments and unwearied dili-
 "gence and application."

Who that reads the above beautiful
dium, but must, with me, feel a kind of pre-
 possession, in favour of the writer! and who,
 that is at all susceptible of the force of religion,
 but must confess a reverence due to the senti-
 ments it conveys; and lament, if an occasion
 should occur in the following strictures, of ad-
 verting, with an eye of censure, to any of the
 parts of this goodly fabrick!

This ingenious writer proceeds as follows :
 "It is a clear and lamentable truth, that in an
 "attempt to improve, there are many and
 "great impediments to be surmounted; none
 "of which militates so strongly, or with
 "such efficacy, as established or inveterate
 "custom; to custom, there is certainly a
 "deference due; but when reason and experi-
 "ence

“ence have proved a custom to be of a
 “pernicious, and unprofitable tendency, who
 “will be so hardy as to assert, that such cus-
 “tom ought not to be abolished?”

Here I am compelled to ask the writer, what
 reason, and what experience, he would, in
 the present case, be understood to refer to.

But he goes on:—

“None will, but all, cry out for proofs:
 “but when they have almost ocular demon-
 “stration, they shut their eyes against con-
 “viction; and, obdurate in error, suffer them-
 “selves to be overborne by prejudice, and
 “received opinion; though, like an ignis
 “fatis, it should lead them into difficulties and
 “dangers: so many examples of this sort,
 “take place, every day, that none can be
 “ignorant of the truth of my position; but,
 “when improvements are so glaring, that
 “in spite of prepossession, the most bigoted
 “are necessitated to acknowledge the obvious
 “imperfections of custom: where, I say, im-
 “provements have passed the fiery ordeal of
 “prejudice, is it not strange, and almost in-
 credible,

“credible, that even then men continue
 “wedded to the errors of custom, and;
 “through an unaccountable caprice, reject
 “that, which all allow to be judicious, laud-
 “dable, and meritorious?”

I do not think myself quite at liberty to con-
 clude that the writer, thus far, has any particu-
 lar description of men in view, to which these
 his general remarks, apply, as the brewer has
 not yet been named. I am therefore left to
 conjecture only, which inclines me to suspect
 that the brewer was glanced at; and, indeed,
 the next paragraph brings him forward as the
 object, which the writer wishes to relieve;
 where he observes, “these reflections are the
 “result of a mature consideration on the pre-
 “sent state of brewing, an art of the greatest
 “moment in this kingdom; yet, which, on
 “a retrospective view, I find to have received a
 “very moderate share of culture.” What
 clue the writer may have for directing his en-
 quiries, regulating his reflections, or forming
 such positive conclusions, as to the uncultivated
 state of the brewery, he has left us quite in
 the dark: neither does he attempt to as-
 sign

sign a reason why that inequality should take place in the dispositions, or minds, of men, formed equal by the Creator, as is evidenced by his account in the certain advances that are made in all other arts and sciences, the brewery alone excepted. That the sturdy sons of the brewery, should be marked out as the most unfinished, and the least susceptible of improvement, or that they shall be found to be full a century behind the cultivators of other arts, is a consideration which, but for their ignorance and unfeeling natures, must render them extremely miserable; not to mention the idea of being placed so low in the scale of the arts, that out of their numerous body none can be thought worthy of receiving, or capable of giving, a word of advice to another, be his practice of ever so long standing, or extent; or let his attention to his business, in all its parts, have been ever so great; but all must be insulted by the intruded lessons of such as avow themselves ignorant of the most trifling part of the practice in the brewing art; and reproached for their obstinacy in refusing to believe all that the writer says. It is high time, indeed, some have already said, that the brewers

should

should stand forth, and, with a becoming spirit, assert their own consequences when it seems, by the liberties they are taken with them, as if it was thought that any thing would do to make up lectures on brewing. Who is this wonderful genius, if the world wishes to know? or what his calling, profession, or whence he came? I am quite unprepared to answer such interrogatories; farther than, that I believe he did not come from the East, but the opposite point. But to proceed,

“I have been farther led to them, (i. e. reflections) from the great, the astonishing opposition I have received, in an endeavour to explode a bad, and introduce a just and proper system; an opposition, the basis whereof is sanctioned on the usage of our ancestors; as if we were bound to a veneration for their errors, and to an implicit confidence in their ill-digested notions.”

The self-importance and presumption, couched in this short sentence, is great; but seems to require no reply, as the gentleman immediately proceeds to the grand theatre of

G action

action. Not satisfied with having once upbraided the brewer, by drawing a picture of his wretched and deplorable situation, he now unmercifully drags him over the same ground again, by observing :

“ Within these one hundred years, it appears, that the art of brewing has received little or no improvement, save the application of the thermometer and hydrometer ; the deficiencies, the imperfections of the mode, at present universally adopted by brewers, are so self-evident to any person at all acquainted with the art, that I made it my peculiar study ; and after a variety of experiments, produced, I will be bold to say it, a complete and eligible system ; a system, whose superiority, over that at present in use, all have hitherto allowed ; yet none have been bold enough to step forward and cherish, but still continue to tread the beaten paths of ignorance and error.”

I must beg leave to call off the reader's attention for a moment, from these bold assertions of the writer before stated, to the first lines quoted from

from him (p. 35): admitting the truth of which, is it not as clear as the sun at noon day? is it not as strongly implied as words and language can make it? that the writer is really more than mortal; that he is one of those *rare* instances never before met with, who possesses something more than a superior degree of sense and capacity; that he alone is that *puissant individual*, who hath out-stripped even refinement itself, and is now set down in that very seat, (perfection,) which for wise reasons, had been denied to mortals.

The accumulated wisdom of mankind, or the experience of ages, has not been found sufficient for such great and wonderful things as he has done; and how easily will the writer's description of the obdurate temper and disposition of the brewers be verified. None else could refuse to be enlightened by so great a luminary; or to adopt that system, "which all have allowed the superiority of." Sensible of the weakness of my optic powers, and fearful, that by gazing too long on so great a refulgency, may prove injurious, I reluctantly

turn from it, to pursue the writer's farther remarks, who proceeds thus :

“ The only apology to be made for this pertinacity that at present occurs to me, is the splendid and vast fortunes amassed by brewers, in seemingly a very short space; which people, of confined ideas, are apt to imagine is owing to the perfection of the art, which is a mistaken and erroneous opinion; and how flattering soever the appearance may be, I am ready to prove, to the satisfaction of every unprejudiced man, that the process is inadequate to the design; imperfect, and injudicious: and I will farther assert, though my assertions may prove as disagreeable in the ears of some, as the *croakings* of the ill boding Raven, that I not only point out the amendments, additions, and alterations, necessary and desirable, in the process of brewing; but also a much more expeditious mode of accumulating wealth.”

O ye stiff-necked generation of brewers! are there amongst you such, to whose ears the melody and cadence, of the writer's music shall,

shall be like the *croakings* of the *ill boding Raven*? Will none of his wise precepts assure you to become his disciples, by renouncing your errors, attending to his amendments, additions, and alterations, which are necessary and desirable in the process of brewing? Surely, if every other persuasive failed, this last should have its weight with you, viz. that of an expeditious mode of accumulating wealth: if gold has no charms for you, the writer may well despair of making converts from amongst you: is it fancy, or do I really perceive some smiling, at the writer's metaphor of the croakings of the ill boding raven? And, obdurate in error, retort it on him, by remarking the ground that he has taken, and the mighty powers he assumes, are ill boders of success: such faithless, incorrigible scoffers, who refuse to soar with the writer, into the exalted regions of science, and participate with him in the refined pleasures, that are inseparable from the acquisition of knowledge, deserve no other reply from him, than, that as they are so confined in their ideas, and so groveling in their views, they must prove a disgrace to any station but that in which they now stand;
and

and if, by the writer's important discoveries in the art, and mystery of brewing, they were to be precipitated into the possession of wealth too hastily, it might prove dangerous to men of that description; therefore the writer will, from his great goodness, be inclined to leave them in full security, to enjoy the small share of knowledge, which providence has allotted them.

I shall now venture to proceed a little farther with the writer's remarks on the brewing business, which brings forward a fair definition of what it consists; or to what genus, or class, it belong; but for this piece of information, the brewer might have remained all his life time ignorant of the high rank he stands allied to, which should prove no weak stimulus with him, to cultivate, in his humble station, the good opinion of that learned body, by adopting all their measures: for,

“ The brewing business, being a series of
 “ chemical operations, requires more judgment
 “ than most other arts, as a compitant know-
 “ ledge

“ ledge of chemistry is almost indispensably
 “ necessary.”

Now, Mr. Brewer, what will you think of your self-sufficiency? Will you any longer contend with such respectable authority, or doubt of the success that must result from closing with the writer by renouncing the errors of your former ways: be no longer despisers; you can no longer plead ignorance; for the mouth of chemistry has founded it in your ears, that your art, in all its parts, is circumscribed within the pale of chemistry; and although it is not said, you are left to draw your inferences, which are very easy and natural, that perfection can never be obtained without the aid of some of its professors. What perverse tongue do I hear muttering, when the professors of chemistry made their perambulations through their province? did they make tenders of their assistance to none they found in it, but the brewers? Did they pass by the sugar-baker, tallow-chandler, and others, unnoticed. For we suspect, according to what the writer has said of our art, that all others, even the match maker has no room to despair of arriving

riving in time to the perfection of his or her
 art; if they will but yield to the instructions of
 chemistry ; a word of reply from the writer
 to such character, even of the most keen re-
 sentment, would be to pay them too great a
 compliment; for they have sufficiently declared
 to the world of what description they are ;
 busy bodies, prying into other men's business,
 and neglecting their own ; and this folly ac-
 counts for the very great neglect which has
 been evidenced in improving the art of brew-
 ing complained of by the writer, who also, in the
 next paragraph, remarks, " Into what a va-
 " riety of unskilful hands has it fallen, all
 " calling themselves brewers ;" (and, with a
 truly patriotic spirit, remarks farther) " It
 " would be happy for those who are obliged to
 " drink beer, that the legislator would inter-
 " fere and prevent any person from brewing
 " for public sale, who had not first obtained
 " a certificate that he was, in some measure,
 " a judge of his business."

There is no being out of the way of
 interruptions and impertinence. I am now
 again stopped in proceeding with the writer's
 narra-

narrative by the unmannerly interference of another who remarks on the necessity of the legislative interference, that it should extend also to prohibiting any from giving lectures or lessons on brewing, until a certificate had been obtained of his competency : and now the subject begins to assume a very serious turn, who are to be censors ; for amongst the brewers, none can be found worthy ; they are deeply immersed in ignorance, and wholly under the influence of error ; Mr. Long is but one, and his system, even supposing for a moment that it is eligible, yet as it is but beginning to be promulgated, much of his time must necessarily be taken up in instructing such an intractable set of men as the brewers, which of necessity must preclude the public from the enjoyment of so valuable an institution as the above ; which, when the writer shall have so far been successful in his labours, as first to have subdued prejudices, and opened the minds of some in different parts of the kingdom to conviction, such may be admitted by him as masters of the art, and as such be announced to the world, under such circumstances,

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stances, and with such regulations, his patriotic views may be likely to be carried into effect; and in time from amongst his pupils and converts, there may probably be some found, who may be worthy of being styled masters extraordinary in the art. I am far from wishing to out-run, or anticipating advantages that may accrue to the public from such legislative interference; that the subject may probably in time admit of such a latitude, is possible; at least, I have indulged an idea of that kind. We are now proceeding to his last paragraph (i. e.) "the goodness of the beer is generally judged to be in proportion to the quantity of malt and hops used for the purpose. A fair supposition; but one that does not always hold good." The term good or goodness as a relative term, certainly is of various import, and has its limitations; but the subject to which it is now applied, can admit of no difficulty to its acceptation; to say that every species of beer or malt liquors, where even the same quantity of the materials, malt and hops are used, are of the same degree of goodness, would be to assert what com-

common experience has proved to be false; but generally speaking, where a superiority of quantity of the materials are used, the event proves, that sooner or later the best beer is obtained; Burton ale for instance, which has full two fifths more of malt in it, than any other species of ale which is brewed in England for sale, would be badly imitated by the most skilful brewer with a less proportion: but to proceed; “ even he whom we call a judicious
 “ brewer, who looks down with contempt on all
 “ below him, find to his cost, that good malt
 “ and hops will not always produce good
 “ drink. Almost every artist can, with some
 “ degree of confidence, promise for the quality
 “ of his production or fabrick; but in this re-
 “ spect, the brewer is not quite so happy, as
 “ his business depends on a chymical process,
 “ and therefore never certain; for at the very
 “ instant he thinks himself secure, it is not
 “ impossible but all his hopes may be blasted
 “ by some disagreeable flavour obtained, he
 “ knows not how; or an acidity he cannot
 “ trace.”

I cannot help remarking here, that as the writer has been so illiberal in his reflections on

the character and disposition of the brewers at large, he has but little room to expect making converts to his System; for generally speaking, if men are fools, they do not like to be told so: that there are supercilious characters to be found amongst brewers, as amongst all other classes of men, there can be no doubt; but such contemptuous demeanour does not often stand connected with a *judicious* one; for it has been considered that pride and arrogance is the outer garment of a fool: if the brewer has at times to lament the want of success to that extent which his study and application to the noting of causes and effects might give him a just claim to, this should be considered as his misfortune, rather than to be made a matter of insult; but when a man is told that his misfortunes, in this respect, are all owing to his ignorance of the chymical art; and that they must ever attend him until he will become a pupil to such as are adepts therein; who, be they ever so great strangers to the practice of the brewhouse, will lead him into a safe and sure path, whereby not only uniform excellence is to be obtained in his beers, but a saving of 25 per cent. and upwards; and if he

but

but even doubt of the truth, he must be branded with every epithet of contempt. The attentive brewer has (and no thanks to the speculative chymist) found, that in proportion to his care and watchfulness, he has been enabled to form for himself a System of Practice, nearly adequate to his wishes; under all circumstances he is enabled, in some measure, to anticipate the qualities of his barley before housed; and of his hops before picked; and to vary his practice as the seasons may require: this surely is what the chymists must be silent about. The attentive brewer can, in most instances, arrest his business in any given stage of it, and judge of appearances or effects of the real causes, be such effects favourable or otherwise; this also is beyond the ken of the abstracted chymist's eye. In short, it must appear to every unprejudiced mind, that proficiency in any art must be wrought out to greater certainty by men long inured to its practice, if such men are possessed of any tolerable share of understanding. That many useful inventions have of late years made their appearance in the world, is readily admitted; but they have been chiefly confined to the mathematics,

thematics, hydraulics, and the different applications of mechanical powers; and in this, (to take up the writer's idea at the introduction of his preliminary address) I think we may trace the finger of Providence, which at the establishment of the œconomy of nature, seems in a great measure to have circumscribed the limits to which the arts should advance towards perfection in every age; for if it was otherwise, the mind of man would sink down into a torpid insensibility, and a mental languor would pervade all ranks of society.

We are now brought to the writer's reflections, or survey of the whole process of brewing, which he offers in in the following pompous manner:

“ I have asserted that the brewing trade is
 “ still in a state of imperfection; this I mean
 “ to demonstrate by a statement of facts; a
 “ statement so clear as to make it almost self-
 “ evident to the meanest capacity: for this
 “ purpose let us take a compleat survey of the
 “ whole process, investigating singly and in
 “ order as they stand.”

Con-

Confidence in a writer, says the humble and modest Barton*, "is disagreeable to a reader: because readers may have as good an opinion of their judgments, as the writer, and would rather seem to teach themselves, than be taught by any one."

It is but too evident, that the writer has, thus far, uniformly shewn a spirit and disposition no way allied to that of his countryman just now quoted: saying is proving nothing; and saying too much is worse than saying too little; truth needs not the disguise of falsehood, nor will she at all suffer in her modesty by being exposed naked and unadorned: nor appear less beautiful to those who have known and tasted her innate charms for all the opposition or persecution she may meet with; she may for a time, and a long time too, lay, as it were, smothered and disguised; I speak from actual knowledge, but it is impossible but she must come forth sooner or later, to the confusion of her enemies.

* A sound philosopher, and an eminent writer, of the North of Ireland.

The writer's bold and arrogant spirit has been spoken of as highly offensive: there certainly is candour enough to be found in the world, to give him or any other man of genius, credit for improvements of any kind, if the principles of such improvements, as represented in theory, have the appearance of being rationally founded; but men will not easily consent to be dragooned into a belief of what does not appear to be thus supported, or to have their minds taken, as it were, by storm: but as Mr. Long and myself are now on the verge of the field of facts, our respective prowess will naturally be looked for on the ground of argument: when the course of the conflict is to be decided.

The issue of the conflict may appear doubtful, when the characters of the combatants are considered: the one a man of grovelling and confined ideas, no ways allied to science, that has not yet learned to soar higher in pursuit of fame, than to be considered as one of a moderate share of practice: the other a man of erudition, who has drank deep of the Pyrean spring, which has inspired him with a knowledge of all mysteries, who can, at one glance, trace causes from their effects, and with

the nicest exactness, describe effects from causes :
 this sets him above the necessity of practice,
 which he despises.

The proclamation has just now been made
 by the writer, who will demonstrate that the
 brewing business is in a state of imperfection,
 by a statement of facts, &c. &c.

ARTICLE, OR FACT, THE FIRST.

“ It is customary for the maltster some time
 “ about the first of October, to put his grains
 “ promiscuously into the steep to bring round
 “ the course of vegetation; when, for argument
 “ sake, some part will shew an appearance in
 “ about thirty hours after taken out; another
 “ part forty, and a third part fifty hours;
 “ and yet a small part never changes its con-
 “ dition but to putrefaction. For I would be
 “ understood, that even in one field of what
 “ is called good barley or bare, the grain is of
 “ different qualities; a first, second, and third
 “ sort will be found perhaps six-eighths good;
 “ and one-eighth middling; and about an eighth
 “ of little value; which, for the production,

“ and manufacturing of good malt, ought to
 “ be culled and separated, and made each by
 “ itself, becoming thereby considerably better,
 “ and avoiding the disagreeable circumstance
 “ of some being over-drawn, some half-drawn,
 “ and some not sufficiently drawn: all which,
 “ when ground, and put into the mash tun,
 “ must necessarily produce a flavour in the
 “ worts, far different from what well made
 “ malts would naturally have.”

The author suspects the writer's remarks on
 this his first Article, are a little premature, if
 made at so early a period as thirty hours from
 their coming from the steep or cistern; it is
 impossible but the appearances he alludes to,
 should be found, for this plain reason: that
 such corns as are immediately exposed to the
 cold air on the surface of the couch, are soon
 deprived of their moisture, and receive no as-
 sistance from that warmth which is produced
 or generated by that fermentation which has
 commenced in the seminal principles, previous
 to the issuing forth of the radicles, or roots,
 and to the setting forward the back spear; for
 such parts of the grain as lay in the middle of
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the couch or floor, that are in immediate contact with others both above and below, all in an active germinating state; receive, from their surrounding neighbours, both a vivifying heat, and a kind of nutritious moisture, which exhales from them, and which cannot fail of giving energy to their own active powers; and as this situation in all houses, and perhaps at all stages of the work, from the cistern to the kiln, must be extremely various, so the apparent effects will be alike different. To prevent partial vegetation as much as possible, the working maltster is directed to turn the corn frequently on the floor as occasion shall require; the intention of which is, as near as possibly he can to remove those from below, or warmest parts, to the surface, and *vice versa*; preventing thereby a redundancy or excess of root or spear in the one, and deficiency in the other: but with the nicest care of the most skilful man, it may happen that the end proposed to be obtained in turning, has but in a partial degree taken place; it may happen that in one scoop or shovel full of corn moved or turned, one hundred or more of such grains as had been before exposed to the cold on the surface, may be re-

duced to that situation again, and that too for many successive turnings: and where this is the case, a slackness of vegetation must be the consequence; but if the writer's views of classing or culling the grain, has respect to their different sizes, I have spoken on that head in my remarks on the System, to the Victualling Board, (page 19); and, as to that portion of grain which Mr. Long alludes to, as never changing its condition, but to putrefaction, I am of opinion very little of that description will be found in barleys that have been carefully screened; as to the effect produced in the mash tun, or the flavour of the worts, by the vegetation in some of the corn not being so perfect, or fully accomplished as in others, there can be no foundation in truth or experience: for from what has been remarked on the process of malting, it appears impossible but it must ever be the case, that some few grains will be found at the time it is brought to the kiln, with the back spear not quite home, as it is termed, which signifies that a longer time was necessary for nature to complete that operation; and it is known to such, as are conversant in the malting business,

business, that by so much as that is short of the end of the grain to which it immediately tends, the very instant the vegetating principle is excited or awakened, converting every part of the internal substance of the grain, over which it passes from that hard steely consistence, in which it presents itself to us in its natural state, to that fine rich saccharine matter which constitutes its value as malt; but if it be arrested and committed to the kiln before the entire accomplishment of this important work, the only evil we have to fear as a consequence, is, a diminution of its saccharine quality, in proportion as it is found to be short of the end of the corn. It is impossible flavour can receive any injury; for such parts have not been corrupted by any treatment it had previously received, and therefore its nature cannot be changed.

ARTICLE THE SECOND.

"I am of opinion that the present method of grinding malt, does not fully answer the desired purpose; the whole grown grains are ground to a fine flour, while the second

"fort

"fort are only cut, and the greater part of the
 "small grain remains entirely whole, there-
 "fore cannot yield their produce; and if exa-
 "mined when thrown out of the malth tun
 "will be nearly in that state in which they are
 "put in: but were rollers to be adopted, it
 "would answer all the purposes by flattening
 "or bruising the malt, and of course break
 "the kernels even of the smallest grain, and
 "prepare it fully for the reception of the li-
 "quors, preventing the great waste from
 "the present method."

My remarks under this Article are before the
 Victualling Board, and inserted in this work
 (page 20). I do not think it necessary to add
 further on the subject than barely to hint, that
 I am not quite of the opinion, that what the
 writer terms the whole grown need be ground
 to a fine flour before the end of grinding, even
 the smallest might be fully answered; and the
 second, as he calls it, if but cut in that part
 where its malted contents lay will yield to the
 impression of the menstruum; else what will be
 the ideas of a private gentleman in the West
 of England, he who would never suffer his
 malt to be ground at all.

ARTICLE

ARTICLE THE THIRD.

“ The liquors are univerſally put on the
 “ maſhing tun at too high a degree of heat,
 “ which operates with violence on the fine
 “ flour of the malt, and taken off too cold;
 “ therefore not a complete extract, as exceſs
 “ of heat or cold militates againſt the extrac-
 “ tion; nor can the brewer, from the pre-
 “ ſent method of maſhing, uſe his liquors
 “ with more ſkill; for, if they were let on at
 “ a higher degree of heat than at preſent, the
 “ keive might ſet, and the malt harden, and
 “ in ſome meaſure become callous, and ren-
 “ dered incapable of giving its contents; and
 “ if the liquors were put on at a lower degree
 “ of heat, the keive might likewise ſet for
 “ want of a ſufficient heat.”

I am of opinion, there are few of my readers
 but will find with myſelf, equal aſtoniſhment,
 both at the arrogance and ignorance of this
 leading paragraph; and did I not conſider my-
 ſelf as writing to an intelligent and diſcerning
 public, and not to the author of ſuch incon-
 ſiſtencies,

sistencies, I should hardly think them worthy of a reply. From what source or channel of information or instruction could he possibly find occasion to make such an insulting declaration? As for experience, he confesses that has no place nor ever will with him: it is more than probable he has never seen the real practice of a brewhouse in his life, nor as much as heard what those heats are, which he pronounces too high or too low. But in order to form a more consistent idea of his folly and weakness, we must proceed with the next paragraph: " This (he says) I remedy in the following manner: Near the mashing tun I place a shallow copper or other vessel that will readily heat, the curb of which is on a level with the tun, which contains from two to six hogsheads (according to the dimensions of the tun) more or less; and at the lower part of the copper is a cock from two to five inches diameter, more or less, to conduct the heated liquor from the copper into a tube which passes down the external part of the tun, and enters it through an aperture about six inches from the bottom, then performing two revolutions through
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“ the body of the tun, and communicating its
 “ heat to the worts as it passes through the
 “ tube, at a convenient distance from the
 “ place it first entered, it runs from the tun into
 “ a cistern or tub, situated as near as possible
 “ or convenient to the copper or heating ves-
 “ sel: in the tub or cistern is placed a pump
 “ for the purpose of conveying the cooler li-
 “ quor back to the copper or heating vessel,
 “ there to receive the heat of 208 degrees
 “ (which it will require after the first half
 “ hour) and then convey it away through the
 “ tubes in the mashing tun as before, and so
 “ on as long as the working brewer finds it
 “ necessary.

“ By adhering to this process, the first li-
 “ quors may, with the greatest safety, be let
 “ on the malt from twenty to thirty
 “ degrees lower than the present practice;
 “ by which means it operates gradually, and
 “ with gentleness, opening and expanding the
 “ malt and raw corn, and preparing it for the
 “ reception of sharper or warmer liquor, so
 “ as to extract the whole of the saccharine
 “ quality from the malt and raw corn; also the

“ mashing tun, instead of losing its first heat,
 “ which is done by the present practice, con-
 “ tinues to increase in heat every moment, by
 “ conveying the heated liquor through the tube
 “ in the tun: by which means the working
 “ brewer, at the end of two hours, can have
 “ the tun at any degree of heat he shall think
 “ most fit for the quality of his malt or corn.
 “ Persons who wish to save expence, may heat
 “ their mashing tun at the side or bottom, by
 “ a large piece of metallic substance, made fire-
 “ proof, and fixed therein; which in some de-
 “ gree would answer the end proposed, but
 “ with greater trouble and delay.”

I think it necessary to premise, previous to
 any further remarks on this Article, that, by
 the writer's frequently adverting to the term
 raw corn, it seems as if he had placed the
 brewery on the footing of the malt distillers,
 who use raw corn or meal with their malt in
 the mash tun, which the brewer, were he in-
 clined to do it, is by law prevented; a circum-
 stance the writer may not be apprized of.

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We are now to combat the charge exhibited against the present mode of brewing, or at least that part of it which perhaps is the most essential, viz. forming the extract. The charge is not partial, but universal, against all. We are not told to what degree the error amounts; that we are left to guess at, or to learn from the writer's more abstracted or private communications; we are told, indeed, something of the effect that is produced by too high a liquor, and also of a too low one, which is that of an imperfect extract, and (which is a very great discovery to the brewer) both effects are to be considered as but one effect. This is so new and novel a way of treating the matter, that a brewer cannot but feel himself chagrined at the idea, who has been duped out of considerable premiums, at times, for no other knowledge or mystery to be obtained than that of going to the copper-side, properly instructed to take his liquor for every kind of beer, it having been intimated to such that, on the forming the extract consistently, by that means depends the whole of their success; and that an error in this cannot be remedied by any subsequent means. By forming the extract consistently

is not meant merely the obtaining the whole of the essential qualities of the malt, but the forming it in such a way that the different principles of those qualities shall be so arranged in the extract as to concur together in the accomplishment of the end ultimately proposed to be completed by fermentation. Now, the brewers are made more sensible of an error committed in this respect, than they are of a loss sustained by having part of their property undrawn from the goods or grains. The evils that result from unskilful practice, on the former account, unhappily for the writer's system, he does not seem to have the most distant idea of. The fine flour of the malt he seems to be most anxious about preserving from being acted on with violence; but we will admit, for argument sake, that he has a private system for taking his liquors to be reserved for specific terms of communication to the brewer; how is that heat to be communicated, in an equable manner, to every part of the mash or malt at the same instant, by means of his tubes and warm liquor round the sides or bottom of the tun. He having spoke a little of a too high and a too low liquor, cannot

not be reasonably offended at the brewer's remark on this head, or of his suggesting his fears for the consequence that must result from the adopting of his mode; for to him it cannot appear possible, but that those parts of the malt which lay round the tubes must receive too great a heat, while the remoter parts may be too cold. The brewer also, who is very tenacious of a strict adherence to the several kinds of malt he may have to use, and to the different purposes and intentions of his work, respecting the kind of beer to be brewed, who have ever found the heats which he has adopted proved adequate to the end, cannot but shudder at the idea which is conveyed in the writer's asserting, that, first, a heat of 208 is required in half an hour, and can be communicated by the adopting of this plan; and equally loath will he be to let his first liquor on from twenty to thirty degrees lower than at present. Without the least intention of obtruding myself on the malt distiller, I cannot but be of opinion, that he, with the brewer, must have experienced that a very slight variation in the heat of his liquors have produced a very sensible effect on his fermentations; and
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it must be so: there is not an agent in nature but has its offices and powers ascertained with the greatest exactness. And can it be admitted, that fire or heat, even in its most gentle operations, shall not, as it were, set its seal on every subject on which it acts; no, verily, for every greater or lesser degree of it makes its own distinct impression. If this be true, by what mode of reasoning can we reconcile the method recommended by the writer's system of applying or communicating of heat to the mash; can it be possible but it should act in a variable, violent, and partial manner, must not some parts be very much injured by an excess, while others shall receive no sensible effect. That part which the brewer suspects to be most in danger of suffering by cold is the surface of his mash, and that part appears to be the most remote from the effect of the writer's scheme. Without further animadverting on the matter, I feel myself compelled to remark, that the proposition or end to be obtained, is both futile and unfounded, and is of the most dangerous nature and tendency; and of the means proposed for the accomplishing it can form but a faint conception; how
several

several revolutions of tubes can be admitted through the body of the tun without greatly incommoding it, or how a large metallic plate can be applied, made fire-proof to the side, or bottom of the tun, to answer the purpose of tubes, is such a stretch in the mechanic art as I despair of ever arriving at.

ARTICLE THE FOURTH.

“ Every brewer ought to be mindful of the
 “ time his worts continue in the underback,
 “ especially in close warm weather ; for there
 “ are disagreeable flavours received and im-
 “ bibed by the worts in that state.

“ Here some brewers are ready to catch at
 “ this expression, and say, that the brewer that
 “ would suffer his worts to continue to be for
 “ any considerable time in the underback, may
 “ be totally ignorant of the business. Now,
 “ give me leave to ask that brewer, what the
 “ unfortunate man must do who is not in
 “ possession of a second copper (which is nine-
 “ teen times out of twenty the case through-
 “ out the country parts of England) with his
 “ first

“ first worts. I answer, that they must lie
 “ in the underback until the second liquors
 “ are put on the kieve, as the copper is not
 “ ready for the reception of the first worts un-
 “ til it is divested of the second liquors, which
 “ operation takes up a considerable time, and
 “ much damage often happens there that is at-
 “ tributed to other causes. To prevent the
 “ worts from thus receiving disagreeable fla-
 “ vours, I lay aside the use of the underback,
 “ the grand cause of such flavours, and, in-
 “ stead thereof, I place a tube at the cock of
 “ the mash tun to receive the worts as they
 “ come off, and convey them to a cistern or
 “ refrigerator, which is supplied with a con-
 “ stant stream of cold water, the worts pas-
 “ sing through that medium in spiral tubes
 “ soon loses that heat which so often proves
 “ prejudicial to the brewers in warm weather ;
 “ then I pass it from the tube into a vessel in
 “ which pumps are placed to return the worts
 “ into the copper for the purpose of boiling
 “ off. N. B. All the vessels for receiving the
 “ cold worts must be placed lower than the
 “ source from which the worts come.”

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I confess myself at times almost staggered in my conclusions, and I nearly question the testimony of my senses respecting the existence of a character like the above: and were it not that I recollect some assuming bold assertions of his made to me, in the course of the few hours conversation I had with him, I should be tempted to believe it all a delusion; but I am compelled to believe otherwise; and that there is a character found hardy enough to stand up and harangue a credulous generous set of men, on subjects that would be insulting even to school boys; and that there should be found amongst the officers of state of so great a people as are the people of this nation; such as the writer has found either by their zeal for the good of the service, or by their being wholly unacquainted with the nature of the subject, fit persons for him to use his consummate address on. What can the world think of such a character, coming forward in that bold and impudent manner he has done, and assert that for a fact which he has no more proof for, or conceptions of, than what is at this instant in debate in the Divan at Constantinople; what does he know of disagreeable flavours imbibed,

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or

or the source of them; can he put his finger to the real cause of any flavour, either agreeable or the contrary, that is found in malt liquors; or what has he seen of the whole of the breweries in the country parts of England, to be so positive as to their having nineteen out of twenty, but one copper; it would be paying him too great a compliment to attempt a refutation of this his remark, by replying, that according to the mode adopted for brewing, even the most celebrated ales, in nineteen instances out of twenty, more than one copper would be superfluous. I have indeed, in my remarks under this Article to the Commissioners, (page 23) admitted that some evils of the kind alluded to, have occurred; nor am I about to disavow those remarks; but they so very seldom happen, even in the warmest parts of the summer, where a proper attention is paid to the business that they do not stand classed amongst those objects to which the brewers principal attention is directed. If any thing could have exceeded such arrogance, or the insult offered to our understandings, by asserting that for a fact, or declaring that to be a standing evil which is but little more than an
 imaginary

imaginary one, it is the means proposed for the removal of it; may it not, with some degree of propriety, be remarked, that Belzebub, *a real devil*, will, in this instant, be employed to cast out an imaginary one, or that the agents sometimes used for catching a thief, are worse than the supposed thief. Who that have given the subject the least turn in their minds, can but be of opinion, that a wort coming hot from the mash, and immediately plunged into a cold medium through a refrigerator, must receive a material injury in its constituent principles; and instead of being rendered thereby more secure, from imbibing ill flavours, made abundantly more susceptible of them; and who that have been in the habits from necessity many times, of conveying their worts, but for a short distance, through pipes, but have found such pipes, in spite of the greatest care, to contract a foulness which often proves of the most malignant kind; and being confined, no methods of cleaning them have ever been found sufficient; the consequence has been, that the worts, by passing through such corrupt channels, could not but receive material injury; particularly in warm weather, when distem-

pers are the most predominant : now if evils of this nature frequently occur, where a wort is in some measure guarded by the restraining qualities of the hop ; and when it has lain for a time, after boiling, in the coolers, to deposit its feculencies before it passes through such pipes as above ; what can we hope for from sending a raw wort such a journey, without the least preparation for its support, either from boiling, or hops ; but the whole of its young and tender parts left naked and exposed to such very harsh and inclement treatment, it must surely produce effects no way favourable to its flavour.

I hope my readers will excuse my having, in my remarks on this head, descended a little towards abuse : my only apology is, that the cause in which I have embarked, I consider not mine only, but that of the whole body of the brewers ; who, if they felt as I do, at the indignity, reproach, and insult cast on them, will, I doubt not, think me justified in meteing out to this great oracle, as he has meted to the brewers. I stand pledged to the public to communicate to them my sentiments on this
extra-

extraordinary system, in doing which, I ought faithfully to acquit myself, by not withholding any part of my opinion. Accordingly I shall close my remarks on this head, with my entire approbation of the principles of that plan in the last paragraph, for the disposing or placing of vessels that are to receive fluids from others lower than their source. I am persuaded that no one that reads it, but must, with myself, admire the prettiness of the remark, and be also inclined to thank the author for this great discovery.

ARTICLE THE FIFTH.

“ The average boiling that the worts and hops
 “ now receive is two hours and upwards; if
 “ the brewers are asked their reason for so
 “ much boiling, their answer will nearly be
 “ that it makes the drink keep better, and also
 “ for the sake of the hops, the longer they boil
 “ the more of the bitter is extracted, and the
 “ founder the beer will be; which is highly
 “ erroneous: for two or three hours is not a
 “ sufficient time to have a full and good ex-
 “ tract of the hops. Nor is a fluid possessed of
 “ fo

“ so much gravity, as the worts capable of
 “ extracting in that or any time their *produce*,
 “ without losing at least 25 per cent. of the
 “ most essential and valuable part thereof, by
 “ evaporation ; nor is it possible, from the
 “ present method of boiling the wort and hop,
 “ to have and detain their essences.”

Mr. Long has been a little unfortunate in
 his channels of information respecting the ave-
 rage time of boiling the hops ; it is to be feared
 some one or other of the people he has had
 recourse to for intelligence, have, at times, im-
 posed on him. It is a pity such an advocate
 for truth should be made the ostensible instru-
 ment of publishing falsehoods, and highly
 blameable such a one must be, who would
 wilfully or ignorantly make a false statement
 of such matters as the present, which are of
 so interesting a nature, more especially when
 the purity of the enquirer's motives is con-
 sidered, which is simply to explode a bad system,
 and introduce a good one : and how will he be
 able to effect this great object (being himself
 unacquainted with either the eligibility of the
 one, or errors of the other) without the infor-
 mation

mation of such as have had experience therein; and surely such as are found capable of misleading the enquirer in an affair of such moment, ought to be wholly excluded from the benefits that are to result from perfect or complete systems; for they ought to consider that much is due to a genius like the enquirer, who has declared (not in vague indefinite, but positive and specific terms) that 25 per cent. will be saved of the most essential and valuable parts of hops, parts which neither brewers or chymists have hitherto been able to reduce to any palpable form, so as to define their constituent principles: but it seems the writer has entered into the secret arcana of nature, and discovered that in her most curious operations, she sports with the property of the poor brewer; and wastes infinitely more than would be deemed a handsome profit: and what is still a greater mortification is, that with this information, Mr. Long asserts, that it is impossible the evil can be remedied, without adopting his plan; for he observes, that

“ The essential oils of all vegetables begin to
 “ fly off as soon as they arrive at the boiling
 point.

“ point, nor do they want the smallest degree
 “ of fermentation to give their contents ; and
 “ hops being a vegetable, the essential oils
 “ thereof begin to evaporate by the present me-
 “ thod, as soon as they boil, every moment ef-
 “ caping ; and while you are endeavouring to
 “ obtain the gross bitter and earthy particles,
 “ which remain, you are losing the high fla-
 “ vour and essential parts, which is an irre-
 “ parable loss, more sensibly felt than under-
 “ stood. Suppose, for instance, it were asked
 “ at whose expence the atmosphere is so highly
 “ impregnated with the agreeable sweet of the
 “ malt, and the pleasing bitter of the hops
 “ all the time the worts are boiling ; and for a
 “ considerable time after the worts are let into
 “ the coolers. It is so obvious that there is
 “ not the least occasion to comment upon it.”

I have before intimated (page 26) that
 the finer essential oils of some vegetables,
 but not all, begin to fly off at the boiling point ;
 and some, I might add, at a much lower de-
 gree, but I have my doubts if the oil of that
 subject, which we are now treating of is an
 essential, or constituent principle thereof, being
 so

so loosely attached thereto, as to be in one continued state of avolation, even without the agency of fire, or solving properties of the water as a menstruum; but whatever foundation there may be for such doubts, or such distinction, it is evident that no attempts that have been made to restrain the flight of this fugitive principle, have been found fully satisfactory; the first exhalations have been collected* for tasting, which have been found to possess no sensible qualities more than that of common water. Specific gravities have been resorted to by boiling a decoction of hops made either from cold or warm infusions, until it has been reduced to any given quantity; which quantity has been again restored by the addition of fresh

* I have suspended a piece of clean dry sponge over a large copper, which had but a very small part of its surface left uncovered by the boiling back for the steam or vapour to go off by; the sponge I hung in this uncovered part at the time the first wort began to boil, and remained till it absorbed enough of what exhaled from the wort to squeeze into a clean glass, which was found to possess scarcely any thing different in taste from common water; this experiment has been confirmed by another, which was to collect the vapour from some hops boiled on purpose by themselves in water in a close covered vessel: what could be collected from this cover, of the vapour which was considerable, was apparently tasteless as the other.

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water,

water, and its gravity found to be precisely what it was before, that we are almost tempted to believe that the offices assigned by nature to this very subtle fragrant property of the hop, are not of the most essential kind as to the preservation or flavour of malt liquors ; else how is it that it has hitherto eluded the most accurate experiments of the best chymists to annalize the hop in such a manner as successfully to bring forward this principle in its own distinct characteristical form, with such obvious qualities as we are solicitous of retaining.

Our senses and faculties are most wonderfully apportioned to their respective functions or offices ; those of smelling seem to have an eminent preeminence over the rest, the grateful odours of the delightful flower-garden awake in us sensations of the most exquisite pleasure, while at the same time we seem to bewail the inefficacy of our powers, for realizing a more permanent enjoyment of those transient fragrant sweets, which nature seems for a time thus profusely to spread around us ; but who has ever been successful in catching or securing even the faintest similitude of what is thus sent
abroad,

abroad, destined no doubt to the noble purposes of generation? And on the other hand, how very inadequate are our powers to the corporifying or bringing to the test of any other of our senses but that of smelling, those naucious and malignant emanations that arise from putrid matter, with which the air is frequently impregnated, and what awful pestilential consequences sometimes result therefrom.

In the two instances just alluded to, we perceive as it were, the formation and decomposition of natural bodies, or the windings on, and windings off of life; it is ushered into existence by a train of the most animating pleasures, it departs in most instances with the most loathsome and baneful attendants,

It is but natural that we should suspect a loss from the hop on the ground Mr. Long has taken up the subject; that idea has pretty much operated on my mind, and put me on several experiments; for being fully satisfied, I have for a number of years adopted a plan of sprinkling the hops for an hour before they have been committed to the wort in the copper,

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with

with warm water, with a view to open and expand the whole body of the flower, the better to bring away that yellow farina or mealy matter, in which it has been conjectured the above volatile treasure lay speciflicated, under an idea that the glutinous quality of the wort might, in some measure, close up the little cells where it was deposited, and render a longer time necessary in boiling, before it was all dislodged; and as I considered this to be the chief object to be secured as much as possible, it became my care that it should be left wholly in the first worts, and thereby not subject to another evaporation, by being boiled in the second; the event, if not to the full extent of my wishes, inclined me to recommend the practice; for it has been strongly contended by some, that they have found that ten pounds in an hundred weight might be saved; for not only the parts of the hop, which we have been principally alluding to, are extracted the better thereby, but that the other more permanent qualities are more effectually digested, and left in the wort. I have likewise taken the hops which I have intended for use the day before brewing, and infused

fused them in a sufficient quantity of liquor, not only fully to saturate them, but to cover them at some depth, and draw the liquor therefrom on the morning of the brewing day, just as the first wort has been going into the copper, where the hops are then conveyed as at other times, and boiled as usual, the liquor not boiled, but conveyed to the wort in the coolers, when almost cold; this has been done with a view to prevent an escape of this volatile principle; believing that we could, by that means, detach it from the hop, and not suffering it to be boiled, we should secure to ourselves the wished-for end; and I am inclined to give this the preference for this distinct purpose, to the former method of sprinkling; but the heat of the liquor thus applied for infusing, from various degrees of it, which I have used, I must prefer that of summer heat, or 75; and for this plain reason; that a greater degree I have found by smelling, would produce a very sensible evaporation of those parts I was endeavouring to save; and at a lower degree, a perfect solution of them was not obtained.

I am a little out of order in my manner of proceeding

proceeding with Mr. Long's system, as I should have went on to shew his method of preventing a loss on the above account of 25 per cent. of the more essential and valuable parts of the hop by evaporation.

“ This, he says, I remedy, as the great object
 “ of long boiling the worts is rendered useless,
 “ by my invention of taking the extract from
 “ the hops in a separate manner from the
 “ worts; therefore I boil my worts no longer
 “ than from fifteen to twenty minutes, and by
 “ pursuing that method, I save one barrel in
 “ the score, much time and fuel, and regulate
 “ my lengths accordingly.

“ The manner in which I take the extract
 “ from the hop is as follows: I steep the hops
 “ the day before they are to be made use of, in
 “ a copper prepared for that purpose, and put
 “ in when the water is blood-warm, and there
 “ let to remain covered on a slow fire for at
 “ least fourteen hours, and not raised to a
 “ greater heat than 175 degrees, till the last
 “ two hours, and then they must be brought
 “ to a simmer or a slow-boil, for a space not
 “ exceeding

“ exceeding ten minutes ; then the fluid, which
 “ should be no more than a sufficiency to cover
 “ the hops, is drawn off ; this must be done
 “ at the same moment that the first wort is
 “ boiled off ; so that this hop liquor may pass
 “ through the refrigerator with the first wort,
 “ and proceed to the fermentation tun ; then I
 “ run fresh liquor on the hops, and bring the
 “ hop copper to a boil as soon as convenient,
 “ as a boil in this stage cannot be detrimental ;
 “ the essential oil being in a great measure ex-
 “ tracted, the hops continue in that state until
 “ the second worts are boiled off, and then
 “ passes as before ; and if I have a third wort,
 “ instead of liquor, I put the wort on the hops,
 “ and continue to boil them for some time,
 “ by which means the whole of the extract is
 “ obtained.”

As I have not the least desire to swell the
 bulk of these strictures, which indeed are al-
 ready carried out farther than I was at first
 aware of, it will be unnecessary to comment
 further on Mr. Long's invention for obtaining
 so important an end as he proposes ; and as I
 have stated my objection to the means, and
 my

my doubts of the end to the Commissioners of the Victualling (page 27). I shall conclude on this head, with one remark to my fellow-labourers in the brewhouse: to what purpose has it been! Oh ye, my companions, that our care and attention has been directed to sending our worts into the working tun, without the least possible sediment; were not our ideas that if this was to be the case, the powers of fermentation would, in proportion to the quantum so introduced, be proportionally injured, altogether chimerical and ill founded; for we now see by the plan before us that both the extract from the hop, and that of the malt, are both sent off together upon this long dark refrigerating journey, with all their foul attendants, not the least or most obnoxious part of which will be suffered to loiter behind, or on the way, unless there may happily be some little intercesses or unsmooth parts in their serpentine passage, to befriend some of the most sluggish parts to stay; and as they will be perfectly secured from being taken up as deserters from their company, will probably take up their abode there, rather than again to be exposed to the severities of such discipline; and invite others of the like description,

description, that may hereafter be pushed through this narrow defile, to stay and assist in colonizing this new settlement. O my brethren! a large field for speculation is open before us; and it behoves us to be very circumspect, for we are not to plume ourselves in being in possession of any one certain clue or principle, the sterling value of which we must doubt of: it is not a partial sacrifice we are called on to make; it is the whole that we must give up. But I proceed to

THE SIXTH ARTICLE.

“ In the cooling the worts the brewers at
 “ present sustain a loss of nearly two barrels
 “ in a score, partly by what is absorbed by the
 “ cooler; and as the external air is ever in an
 “ active state, and particularly so in large
 “ cities whose atmosphere is rarified from the
 “ heat of the burning fuel, together with the
 “ warmth of the inhabitants, that the aqueous
 “ particles are absorbed from the air, which
 “ soon becomes dry, and of course heavier,
 “ and therefore descends towards the earth to
 “ restore the loss; and what object can pre-
 N “ sent

“ sent itself so opportunely as the worts in the
 “ extended coolers of the brewers, that open,
 “ as it were, *their bosoms* with a timely draft to
 “ gratify the thirst of the air to which we are
 “ indebted for our existence.”

Will my readers excuse my proceeding for a moment; for I feel an undefinable sensation pervades my whole system, and a kind of fascinating power has seized on all my faculties, the cause undoubtedly must be that of my attempting to traverse, with Mr. Long, those exalted regions of science which none but the abstracted metaphysician, or the profound philosopher, can be found capable of; what a groupe of the most animating ideas are clustered together in the above recited paragraph, and all of them both *beautiful* and *sublime*; what a striking picture does the last part paint on the imagination! the writer, with that ingenuity which seems peculiar to himself, has cautiously guarded his readers against the dire effects of being transported with a too sudden burst of such unparalleled ideas, and have adapted, with wonderful address, his gradations; and wound up our minds, by gentle and easy degrees, to the grand climax.

I con-

I confess myself to be so far under the influence of them, as to wish for nothing more than the powers of a Raphael or a Titian, to portray on canvas what is so strongly painted on my mind, which I can by no means do justice to with the pen; were I to attempt conveying an idea of what I feel on the occasion, I should begin by describing the atmospheric air of great cities, paying its addresses to the extended bosoms of the brewers' coolers, and banquetting on the virgin sweets which they possess, till fatiated with the delicious draft, it rises from the luxurious lap, and bears away the rich plunder which it disperses with a prodigal profusion to the surrounding air; but what must the brewer feel, who reflects that these noon-day feasts, and nocturnal revels, are attended with an expence to him of near a tenth part of his most valuable property; surely he will be tempted to contract the wanton bosoms of his coolers; and how can he more effectually do this than by allowing, according to Mr. Long's plan, no bosom at all; for it must be admitted they have their attraction: but in order to our being masters of the plan, we must proceed,

" I well know," says Mr. Long, " that the
 " judicious brewer will say, that in all evapo-
 " rations it is the aqueous particles which are
 " the readiest to fly off; and I totally agree
 " with him; but such parts are sure never to
 " depart without company, that portion of
 " the worts that escape, though for the most
 " part aqueous, is possessed and combined
 " with the finest particles of the malt and
 " hops.

" By the following process this will be fully
 " remedied, when the wort is boiled off, it is
 " conducted from the cock of the copper or
 " boiler into a tube of a proper dimension
 " which passes the wort from the cock to the
 " large cistern or refrigerator, and there per-
 " forms several revolutions in a spiral manner
 " through the same tube, which is immersed
 " in a constant supply of cold water, where it
 " loses the greatest part of its heat in a short
 " time, and from thence continues in a straight
 " course through the tube a little elevated, and
 " of a suitable length, placed in brick work,
 " until it meets a small refrigerator, supplied
 " with colder water from a reservoir made
 " for

“ for that purpose, at the head of the works,
 “ from whence a continual stream runs on the
 “ surface of the tube down to the great refri-
 “ gerator, cooling it as it passes, in order to
 “ enable the working brewer to send the wort
 “ into the backs or working tun, at what de-
 “ gree of heat he shall think proper ; the tube
 “ may be made of lead, or any other metallic
 “ substance.”

Now, Mr. Brewer, you are put into full
 possession of the means by which you may
 extricate yourself from that tax with which
 you have till now been saddled, viz. that of
 paying a tenth of all you possess, and that too
 of the most valuable parts of your property,
 to satiate the greedy appetite of a hungry ex-
 hausted air, which have ever and anon been
 bending down to the bosoms of your coolers
 for that purpose. It is my misfortune to be
 of the class of those beings, which nature has
 not distinguished with any great share of per-
 ceptive powers, and am on that account ob-
 liged to acknowledge, that in this instance they
 are by far out-run by not being able to com-
 prehend what is meant by Mr. Long's large
 cistern,

cistern, or refrigerator, into which the boiling hot wort is at the proper word of command to be sent off to perform divers evolutions, or I should have said revolutions, in a sphiral manner, and then to march off by a straight course through the tube, a little elevated, (I suppose is meant, a little up hill) until it arrives at a small refrigerator, through which defile, or narrow way, the wort, with its numerous motley attendants, is, as I apprehend, to pass, and attend to the orders of the general or master brewer, who is waiting its arrival at the further end, and is to determine whether, in this long march, it has been sufficiently refrigerated; but I cannot learn or conceive what steps are to be taken, if it should be too hot, whether it is to remain stationary for a time, or to take another journey; neither can I understand what is to be done, if it should be found to have received too much of the refrigerating influence. As I have apprized my readers of the weakness of my powers, they will easily excuse my turning this part of the subject over to more enlightened understandings to explain. I shall confine my further remarks under this head to that of a statement

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or mode of calculating the quantity of cold water that will be necessary to cool one barrel of boiling wort, stating the temperature of the water at 55; which cold state, if it could be possible for it to impart of its coldness to the like quantity of wort at 212, would reduce it to 133 degrees and an half; the barrel of wort thus reduced, would, by the like quantity of fresh cold liquor or water, and alike intimately communicated, would reduce it to a little more than 94; a third barrel to something more than 74, and a fourth to 65. But as I consider the worts by passing through the tube cannot remain to partake of all the effect of the cold liquor, which it would be capable of communicating, I have added another the like proportion, which is five to one, which I am persuaded will fall vastly short of the real quantity, if the worts are to pass in a hasty manner through the refrigerator, which I apprehend they must of necessity, or the operation must be extremely tedious. I have declared my intire approbation of quick cooling, but not by the means of refrigerating.

Whatever dispatch might be made in cooling
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ing by this means, I do not recollect have been once hinted, or what quantity of cold liquor may be wanting: the statement which I have just made, is on the supposition that the sum or degrees of the boiling wort which is 212, and that of 55 of the cold liquor being added together, will make 267; and the temperature of the two fluids interchangeably communicated to each other, the whole must be found to be equalized and reduced to 133 and an half; but to effect so intimate a communication of the two temperatures, much time must be necessary, and consequently a much greater quantity of cold water will be wanting.

It might appear as if I was about to invade the province of the chymist, by intimating that the plan now before us, if carried into execution in the manner described, will, in my opinion, be one of the greatest violations of the laws of chymistry that can be committed. In all its operations or processes, whether it be in forming extracts, making decoctions, or solutions, or any other act in which a decomposition of the several parts of a subject is, or intended to be effected, a strict attention I have ever understood

stood was indispensably necessary to the separating the pure from the gross and impure parts, and to the removal as far as possible the fæces, or every the least degree of feculent matter; if this be thought necessary for subjects, which perhaps in most instances has no other change to be wrought on their constituent principles, than that of a reiterated operation of what they have already passed; what are we to think of a fermentable one, whose parts are to undergo a change more wonderful in the manner of its being effected, more critical and important in its consequences, than perhaps any one subject the chymists have to deal with; and can the brewer on the present occasion stand an idle and silent spectator, and behold his worts coming from the refrigerator, with the ponderous load of matter which used to be filtrated in his hop back, or deposited in his coolers, but now promiscuously committed to the working tun, together, in one confused mass; can he rationally expect a kindly and genuine fermentation, on which his fortune and reputation so much depends? Is there not just occasion for his fears being alarmed, when he reflects that his ut-

most care and attention were ever necessary to keep on good terms with this capricious agent, fermentation? May he not justly deprecate her displeasure, bringing an host of strangers to her aid? But having brought the wort to the tun, we are next to learn how to treat it in that situation.

ARTICLE THE SEVENTH.

“ It is not very uncommon for some brewers to have the whole of their brewings in a great measure lost for want of sufficient knowledge in the management of the tun in hot weather; if the atmosphere should be at a greater degree of heat than the fermentation requires, it then is in danger, and sometimes passes from a vinous, to an acetous fermentation; whereas in cold weather, although they let off their guile at a certain degree of heat into their tuns, yet by presenting so extended a surface to the external air, it loses that heat which is absolutely necessary for the completion of fermentation, and therefore does not come up to it; by which means it never fines, nor loses
“ that

“ that flavour which is incidental to raw
“ malt.”

As fermentation holds so respectable and dignified a situation in the brewing art, it would be criminal and irreverent to pass by it with indifference; and as we have so eminent an instance of close and intense application, to the investigating its nature and principles before us in the person of Mr. Long, we shall be left without excuse, if we do not try to imitate him; but, some how or other, I cannot help being of opinion, that his system (if it may be so called) is altogether hypothetical; the gentleman, I am almost sure, has been imposed on in some of his researches and enquiries; he has perhaps met with some artful designing fellow, who, for the sake of a trifle, has taken advantage of his weakness; it must be from some such cause, that he forms his conclusions of the frequency of the loss of whole brewings, for want of knowledge sufficient to manage the tuns in hot water. I, for my part, have met with scarcely one instance of the kind, in more than four times seven years; the limitations of the vinous and the commencement of the acetous fermentations,

mentations, are subjects more easily spoken of than clearly understood ; and the evils that he describes which result from a too cold, or languid fermentation, I must put in my negative against the existence of. I will allow him thus much towards it, that if by the negligence or ignorance of the brewer, or by any other means the fermentation falls short of sufficiently opening, or attenuating the wort in the tun, by so much as this is incomplete, so much the longer time will it require to bring such beer to a state of maturity, after it is in the cellar ; but to assert that it will never come fine, nor lose that flavour which is incidental to raw malt, is to assert what he nor none of his informants, or any other man, can prove : but we pass on —

“ The principal brewers, who work on so
 “ extensive a scale, and mix their different
 “ guiles in such quantities, that if one brew-
 “ ing should meet with a fatality, and be ren-
 “ dered unfit for use, it passes undiscovered on
 “ the owners of the house, as the working
 “ brewer will not, if possible, let him discover
 “ his want of judgement ; and hence it is
 “ that

“ that so many disappointments happen to
“ some particular houses.”

(The working brewers will not think themselves much indebted to Mr. Long for this attack on their character.)

“ To be enabled to brew in the warm
“ summer months, I sink my backs or work-
“ ing tuns in the earth, the deeper the better,
“ and cover them close by an arch made of
“ brick or other materials that will totally
“ exclude the atmospheric air; this I do as
“ near as possible to a spring or land drain, as
“ their depth will naturally draw the water
“ from them, which must be so contrived as
“ to pass or flow round the backs or tuns. I
“ also introduce a large tube which passes
“ through the vessel, and from a cistern or
“ reservoir, excluded from the heat of the ex-
“ ternal atmosphere, I convey a colder water
“ by the tube which passes through the tuns,
“ and keep the worts several degrees lower
“ than can be done by the present prac-
“ tice, by which means I can procure a com-
“ plete vinous fermentation in the dog days.

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The sinking the working tuns deep in the earth may answer the same purpose which most judicious brewers have in view, in the choice of a situation for them; which is, that they may be placed as far from the influence of heat or cold, as possible; the closing them so as totally to exclude all intercourse with the air is incompatible with the laws of fermentation; therefore inadmissible: the surrounding them with a stream of water can produce little or no effect to the beer, if the refrigerating influence could be sensibly felt through an oak plank three or four inches thick; our poor seamen who turn into their cabins or hammocks, would be refrigerated indeed, especially such as sail into high latitudes. But the tube undoubtedly will produce some partial effect, or at least those parts which are in immediate contact with the tube, will enjoy the kindly and pleasant influence of the refrigerator, but will part with a very small, if any, portion of it to remoter parts.

“ In cold or frosty weather, if the tuns and
 “ backs should lose the first heat intended to
 “ carry it through the process by the fore-
 “ going

“ going method, you may convey a fresh sup-
 “ ply of warm or boiling water by the tube
 “ which passes through the body of the backs
 “ or tuns, communicating its heat which raises
 “ it to any degree the working brewer may
 “ think proper. By pursuing this method, a
 “ proper fermentation may be had in the cold
 “ season. Thus from a given quantity of
 “ malt and hops, the beer will be better,
 “ stronger, and of a finer flavour, if worked
 “ according to this process, than from the
 “ present practice, and stand the summer
 “ months much better, as the saccharine or
 “ fermentable quality of the malt is fully ex-
 “ tracted and detained, and the essential oil
 “ and preserving quality of the hops are also
 “ retained, in the beers, and not suffered to es-
 “ cape by evaporation in the boiling; besides,
 “ a vast saving there will accrue to the brewer
 “ by an adherence to my mode; a saving of at
 “ least one barrel in a score of the choicest
 “ part of the liquor, from the time it is boiled
 “ off, until it is received into the tun; the
 “ consumption of malt liquors will be much
 “ greater than at present; as the making of it
 “ so much better will be an inducement to the
 “ lower

“ lower class of people to refrain from the
 “ present immoderate and pernicious use of
 “ spirituous liquors.”

It is a little extraordinary that Mr. Long's system, through which we have been conducted to this last head, and all the way told of certain success, should be subject to uncertainty in this stage, so as to need so much care and trouble in rectifying certain accidents to which it now appears liable; in the first place, if the refrigerating scheme is found fully adequate to the purpose of cooling, there can be no danger, if brought to the tun at a proper degree of their generating too much heat in fermentation, by being situated as he proposes; and on the other hand, in cold or frosty weather, if brought safe thither, which it would be almost treason to suppose otherwise, they certainly will be in no danger of losing their heat while there, and consequently can need no assistance from warm or boiling water; which, as I have before observed, can at best act but in a very partial manner: however, the candid reader, being now in full possession of the whole and every part of the proposed plan, will form his
 own

own conclusions of its consistence, and number of SELF-EVIDENT FACTS.

One thing must very forceably strike the reader's attention, which is, that at the concluding part of this last article, Mr. Long, in the enumeration of the many advantages that would result from an adherence to his mode, such as stronger and better beer, finer and of better flavour, &c. confines the saving that was to accrue from not boiling the hops, which, under Article the Fifth, is stated at 25 per cent. and one barrel in the score from the same cause, of the finest quality, or part of the wort; and, under Article the Sixth, near two in the score were to be saved, by laying aside the use of the coolers. We now find the whole amount of saving reduced to one barrel in the score; and therefore are left to this certain or self-evident conclusion, that one, both, or all, are not SELF-EVIDENT FACTS, but on the contrary SELF-EVIDENT FALSEHOODS.

I shall be extremely sorry to give just occasion for any to censure me for harshness or se-

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verity in any of my remarks on the foregoing subject; I am ready to acknowledge that I have, in some instances, imbibed a degree of the author's spirit in my replies; but, if I have indulged it to an immoderate length, I hope it will be attributed to this, that it arose from no other motive than, that I considered his bold and positive assertions as allusive only to the weakness, obstinacy, and ignorance of the whole body of the brewers at large; and as a reproach cast on them.

We must not omit taking some notice of his *few observations*; but to comment on the whole, would be unnecessary, as they would appear uninteresting. It begins with describing the use of the thermometer; "such as
 " for the liquor at mashing heat of the taps,
 " (which from the present method of brewing
 " is highly requisite)" he observes, "and to
 " judge with the greatest exactness what heat
 " your liquors are at in the tubs, and when fit
 " to let into the tun," (what the tubs mean I know not) "to calculate heats that are requisite, and to make proper allowance for
 " the change of weather that may suddenly
 " happen

“ happen. — In summer be rather cooler than
 “ the stated point ; in winter let off at one
 “ degree of heat higher than the standard —
 “ pay every attention to your instrument
 “ while in the tun ; and when the fermenta-
 “ tion is come forward, stop, if possible, as
 “ soon as you arrive at your vinous state ; for
 “ approaching one degree only towards the
 “ acidous, vast quantities of fixed air and
 “ strength fly off — great care ought to be
 “ taken, or the whole of the brewing will be
 “ materially injured, &c.”

We learn from this observation, that vinous
 fermentation is to be but of very short conti-
 nuance, to be stopt as soon as we arrive at it ;
 but I have experienced that in some instances
 it was necessary to be continued four or five
 days. My reader will, I hope, not forget one
 degree of heat to be used higher for the winter
 than for the summer, which it seems will do
 for all sorts of winter weather, let it be ex-
 tremely mild or extremely cold: a very accu-
 rate calculation.

“ The use of the hydrometer is now so uni-

“ versally understood amongst brewers, that
 “ it will be unnecessary for me to say one
 “ word on the subject.” This is the first compliment paid to the brewers’ understanding.
 “ Water is a subject of great utility, as no
 “ brewer can be a proper judge of what he is
 “ about, without knowing its valuable qualities. We are instructed to chuse it soft and
 “ pure, which is known by its want of
 “ gravity.”

Mr. Long must excuse me for remarking that this observation is not without exception ; for Mr. Boyle remarks, that he has found, by weighing hydrostatically, water impregnated with iron, that it was not much heavier than common water. See BOYLE ON GEMS.

After a variety of remarks farther on water, he holds out consolation to the London brewers for the purity of their waters, whose source, or rivulets, it seems are tolerably pure ; this must certainly be matter of great comfort to such who have ridiculously imagined the Thames to be the source or receptacle of every impurity. The hydrometer is now brought
 for-

forward, and some of its eminent services described, “ for ascertaining the quantity of
 “ fermentable matter or parts deposited in the
 “ worts from the malt and hops.”

It was but natural we should expect Mr. Long, who is so great an adept in stating of profit and loss, would have informed us, what the extent of those advantages that have resulted from the use of the hydrometer, under Mr. Long's immediate notice, have been; in pointing out the difference that has been found in the goodness of one malt over that of another; which difference I could have informed him; and can now prove by the journals of my brewings at the Hartshorn in the year 1781, from some malts which I found in store, compared with others, bought under my own inspection, that the former were deficient to the alarming amount of more than 30 per cent. to the latter; and that from this discovery, had I time, while employed, I intended to have laid down a sure and infallible rule for the purchasing of all malts in future, by which it would be impossible the public should have been so much imposed on as before; for the
 real

real value could at all times be found, if required, to a penny a quarter in one parcel of malt above that of another: thus an uniform quality would or might ever be found in the beer.

I believe Mr. Long was not informed, at the time he wrote the above account of the hydrometer, that its offices not only extend to the ascertaining of the gravity of worts, but also to that of regulating their fermentation; thereby pointing to the proper period or crisis for cleansing at all times of the year.

The next observation has respect to evaporation.

“ The brewer will be pleased to observe
 “ that the greater the gravity of his worts,
 “ the less they will evaporate in boiling; and
 “ the lighter the gravity, the sooner they fly off.”

This is comfortable news to those who shall be found obstinate enough to continue in their old erroneous practice of boiling the worts; for as the first we suspect have the greatest share of all the finer essences, both of the malt and hop, we certainly must receive pleasure at being informed of their being in
 less

less danger of evaporating by that means. If this theory does not quite agree with some former remarks, we will not cavil at trifles, because the whole of it seems to look favourably towards us. The next observation worthy our notice, is a description of the mechanical operations of nature at the commencement of fermentation; when it seems,

“ The gross and earthy particles begin to subside, or are thrown off into yeast, and it is then the fixed air expands, and takes up its residence, and incorporates with that volatile matter that produces what is called strength or spirit.”

This definition of the properties of fixed air, and the manner of its expanding and combining with the volatile matter that produces what is called strength or spirit in so hasty a manner, is what I did not before conceive; it may be all right; if so, my notions are all wrong.

The idea that I have formed of fixed air and its offices, is, that it is the grand cementing principle

principle or bond of union that nature has ordained for the conservation of all natural bodies, and that nothing can injure or disturb any of the component parts of a subject while this principle remains undisturbed, which is of itself, abstractedly considered, capable of no contraction or expansion. That different bodies are found to possess different degrees or quantities of it, Doctor Hales has, in his Statical Essays, with uncommon pains and address, gone into a variety of experiments to prove; which in some, such as pit-coal, deers-horn, and some other articles, amount to near one fourth part of the whole weight; but from such subjects which relate to the present observations, he states it, that at the commencement of fermentation, “ the fixed air begins to
 “ quit its hold thereof, and assumes an elastic
 “ form, and that this transmutation continues
 “ as long as any of the parts remain to be acted
 “ on; and, when that, which with the rest
 “ of the constituent principles of the subject,
 “ have been wholly attenuated and decom-
 “ posed, it again concurs in the new arrangement
 “ and combination; whereby that air, or at least
 “ great part of it which was at first dormant
 “ in

“ in a fixed state, was awakened and brought
 “ into an elastic one, is now, great part of it,
 “ to be absorbed again, and takes its residence
 “ as before; and on the quantity so absorbed
 “ and retained, depends the perfection of the
 “ whole.”

This is agreeable, in some measure, to Mr.
 Long's theory; but the idea of expansion
 will not in a chymical light be considered as
 applicable to fixed air. We are next admon-
 ished to admit as little of the external air as
 possible: “ for as all beers are more or less
 “ impregnated with fixed air or gas, the losing
 “ any part thereof is losing something essential,
 “ if not strength and flavour; for it is by ad-
 “ mitting that to escape, your drink is more
 “ liable to become insipid; that beers in ge-
 “ neral do not turn vapid in warm weather, by
 “ imbibing the external air, but by ferment-
 “ ing too freely.”

I am not quite clear as to what Mr. Long
 means by the last two remarks. In the first
 he asserts, that as all beers are more or less
 impregnated with fixed air or gas, the losing

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any part thereof, is losing something essential, &c. &c. Then close on this remark comes another contradicting it (at least it appears so to me); for it says, that beers in general do not turn vapid in warm weather, by imbibing the external air, but by fermenting too freely. If these are really his sentiments I shall take the liberty of differing from him; I shall, in the first place, beg leave to state to him my opinion of beers in general, with respect to the dominion and power that fermentation has over them. I cannot but consider, that as at the very instant every species of malt liquor is brought into the working tun, and the yeast applied to it, that it, at that instant, becomes the subject of fermentation, and continues so to be, as long as any of the characteristical qualities, for which any beers are esteemed, are found remaining in such beer. What have experience proved to us? and what noble purposes have she accomplished? we first find her engaged in breaking down, or volatilizing the gross particles of the essential qualities of the malt and also the hop; which must be sufficiently commutated previous to the extricating, or setting at liberty, those

those properties resident in the subject, which with the fixed air are concerned in the bringing forth those spirituous or inebriating qualities which they are severally found more or less to possess; and also preparatory to that complete or perfect union, finally to be accomplished with the qualities of the malt and hop: here it is observable that beers of light quality or thin bodies, by being less loaded with, or having less matter to be acted on, are soonest brought to that period or crisis, when the interference of art is become necessary for a partial check being given to the further progress of fermentation in the tun; which, but for such interference, might exceed the bounds or limits of a vinous fermentation; but being divided into smaller portions by cleansing the power and stimulous of the accumulated quantity of the yeast, is not only enervated, but by a regular attention to filling the casks, wholly brought away. Now on a review of the subject brought to this period, we are compelled to believe it a progressive work: the least tumult or violence suffered, is an injury not to be repaired; for while fermenting in the tun, a too great intercourse with the external air

would occasion a dispersion or carrying off of a great portion of that air which is continually changing from a fixed state in the subject to an elastic form when detached from it, over which it hovers for a considerable distance above the face of the tun or beer; waiting, as it were, to be readmitted as a component part or principle in the new-formed body in a fixed state, leading back with it a considerable portion of the new-formed or generated spirit. Now if this theory be admitted, we must of necessity admit that the agency of fermentation is still exerted in the further generation of spirit in the beer while in the cask or cellar; and that the less any cask or cellar is exposed to the influence of the air, or the vicissitude of the seasons, the more spirituous will such beer prove, and the more permanent or durable in its qualities. To this, I think, must be attributed the vast difference there is found in beers that have been kept for a long while in bottles, which are known to possess a much greater portion of spirit, and briskness of flavour, than beer originally of the same strength would have in casks, the bottles being impervious to the air; which the best casks, and with the best mode

mode of preservation or situation are not; and to this also must be owing the very great advantages in point of strength, that are known to result from storing beer in large casks, which the larger they are the less proportion of surface is exposed to the air.

We also find that spirits of wine, and every species of spirit, are in one continued state of dissipation, or flying off in the air, and the greater in proportion to their purity; and from analogy of reasoning we must conclude, that all kinds of beer which possess more or less spirit, must suffer from the same cause; the sensible diminution of it may not in every instance be perceptible, but that vapid insipidity, alluded to by Mr. Long, is always experienced.

We are next led to that uncertainty, which the working brewer has experienced in his practice, by not being able to account to himself why two brewings of the same materials, should be so very different in their quality, which it seems might be easily prevented; for Mr. Long “ looks upon it, that by sending
“ our

“ our worts perfectly found to the tun, is a
 “ great forerunner to a compleat vinous fer-
 “ mentation, which seldom failed of produc-
 “ ing beer of flavour, transparency, and
 “ strength, in exact proportion to the sac-
 “ charine matter deposited in the wort ;” and
 proceeding with his observations on this
 very interesting part of the business, he comes
 to aver it as a fact, “ that common ale,
 “ whose gravity does not exceed 26lb. per
 “ barrel, produced from a good fermentation,
 “ will give a greater quantity of pure spirit by
 “ distillation, than can possibly be obtained
 “ from the same quantity of beer or ale, whose
 “ specific gravity is 46lb. per barrel, and the
 “ fermentation was incomplete ; and hence it
 “ follows, that the hitting the crisis with
 “ exactness gives every good, and the missing
 “ of it causes the want of every pleasing qua-
 “ lity beers made of malt ought to possess.”

Was I honoured with Mr. Long's friend-
 ship, I should have asked him if he had ever
 tasted of the Bristol ale, which in point of gra-
 vity, does not differ greatly from his first state-
 ment of 26lb. per barrel, or of the Burton,
 which

which greatly exceeds that of 46lb. per barrel; neither of which are known to be destitute of early fineness, or rich flavour; and if the test of distillation, was adverted to, to decide of the quantum of pure spirit found in each, at the time of cleansing, it would furnish us with very little information, concerning the hitting the crisis with that exactness, which by his account is the only possible means for obtaining the above end, fineness of flavour, &c. for we should find that porter, which is of less gravity than either of the two ales alluded to, would afford more spirit than either, if properly fermented at the time of cleansing; from hence we infer that beers, ales, or all and every different kinds of malt liquors, as they have their different excellencies, or distinct qualities, for which they are esteemed, have their different and distinct crises; for that crisis, which would be necessary for porter, would be destructive to the qualities of either the Bristol, or Burton ale, and *vice versa*; and as, in animal magnetism, on the knowing how to bring every patient, be they ever so numerous, with all their maladies and complaints, be they ever so differing and complicated, to a proper crisis,

crisis, depend the eradicating of those maladies; so in the noble art of brewing: that professor who can conduct his processes with such a vast variety of evils and difficulties that stand opposed to a successful and uniform practice for every species of malt liquor, and hit every crisis properly, will deservedly procure to himself the character of an able and judicious workman, that need not be ashamed to give an account of himself.

I wish not to be understood by my allusions, to what is called the crisis in animal magnetism, that I consider the term as not strictly applicable to Mr. Long's subject; for in my opinion, doctor Johnson himself, were he living, could not produce one more so, and I believe most of my readers will be of the same opinion when they read his next observation, and compare it with a preceding one. " I
 " hope (says Mr. Long) that it is not univer-
 " sally understood, that it is the strength of
 " the malt alone that has that intoxicating
 " power. It may be depended on, that the
 " saccharine quality of the malt is assisted by
 " powerful agents, such as attenuation, and
 " fixed

“ fixed air, which are the concomitants of a complete vinous fermentation.”

Now, my gentle readers, attend to the crisis of the whole matter, for we are nearly at the end of the story.—We have been conducted through a long and tedious journey; our guide has not failed to warn us of many difficulties and dangers that have lain in our way; but he has not been very successful in his endeavours to make his remarks clearly understood, which probably might be owing to our not being more acquainted with crises or critical subjects.

It is but a little that we have passed since we were told that the strength of malt liquors, by a well-conducted fermentation, was in exact proportion to the quantity of saccharine matter deposited in the worts; but we are now told that it is not on the qualities of the malt alone we are to rely for strength or the intoxicating power.

Attenuation, it seems, and fixed air, are to be taken into the account now; I confess, Mr. Long, by this last remark, has nearly struck up my heels; this unexpected manœuvre has

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left me scarcely a leg to stand on ; his holding back these sentiments till the last, as a kind of corps de reserve, has poured such confusion into my system, so as to derange the whole : nor can I by any means rally my forces again to renew the action, without going again over the ground already traversed ; which I suspect my reader will have very little inclination to accompany me in. I shall content myself in just barely stating, that I considered attenuation and fixed air not in the light of auxiliary forces, but as detached from (by the agency of fermentation) the grand body, the saccharine quality of the malt ; and that the greater the quantity that any wort was found to possess of this saccharine quality, the more fixed air was detached from it, in and by that mechanical operation of fermentation, called attenuation ; and that consequently the greater portion of spirit or strength must ultimately be generated.

Two short observations more will close the whole ; and they come in that plain and undisguised form, that we cannot but felicitate ourselves on the idea of being made sensible of the truth of them. They are as follow :

“ That let our worts possess what gravity

“ or

“ or fermentable matter we please, they are
 “ not in a state of giving the least particle of
 “ spirit by distillation, until they undergo a
 “ certain degree of fermentation. All fer-
 “ mented fluids, when heated, will give their
 “ spirit in a greater degree than their aqueous
 “ parts.”

There, Mr. Brewer or Mr. Malt-distiller, look at the vast importance of these two last observations; dwell on the subject, and make it your constant endeavour to derive every possible advantage which such discoveries are capable of yielding; there can be not the least occasion for commenting thereon, but to lament that the ignorance and stupidity of our natures should have prevented our being acquainted with such truths before.

If my reader be not too much out of patience with the tediousness of the preceding remarks, I will conclude the whole by a concise review of the subject, in which I shall endeavour to treat it with that degree of seriousness, which its importance claims, and which I fear I may be charged with not having sufficiently observed in the foregoing pages; over which let a veil be now drawn, so far however as they have respect to the contention betwixt

Mr. Long and myself; let him and me, as become men, with all mildness and tranquillity, await the decision of our respective opinions; which time and experience will not fail of making, and that in the most unequivocal and impartial manner; let us as lovers of science, and admirers of the arts, endeavour to cultivate that liberality of sentiment, which have ever marked the characters of the wisest and best men in all ages and countries, which invariably inclined them on all occasions, to rejoice at hearing of the advancement of knowledge by whatever means; who have ever been found more ready to ascribe merit to others than themselves; the extent of whose judgment, and the measure of their understanding, have been learned more from what they have done, than from what they have said.

Subtilty of wit have no place with such; the simplicity of experiment, or rather the grave documents of experience, is of far greater value in their estimation, than the most acute reasoning, or refined speculation; ever cautious, doubtful, and slow in assenting, moderate and tender in dissenting; nor do these amiable characters adorn here and there one only, but the whole

whole scientific family in all parts of the world.

Who but must have observed the pleasing and astonishing influence it has over the prejudice, pride, and the enmity that has been found subsisting amongst mankind; of what body or society can it be said as of the true legitimate sons of philosophy, with whom no distinctions of rank, birth, or fortune, no differences of political, or religious sentiments, will stand as a bar to the most disinterested and cordial friendship. The whole of such of every nation are urged, as it were, by an irresistible impulse, to form themselves into one social family or republic; if any have, by dint of artifice, crept in amongst them, destitute of the above qualifications, who have been found to be under the dominion of a proud self-opinionated spirit, fond, on all occasions, of emblazening his own judgment, at the expence of depreciating others; the reputation of such has hardly ever been known to rise even to a state of mediocrity. It is therefore a kind of profanation for any to obtrude themselves on the learned world, who do not first impartially examine themselves with respect to the
said

said characters; for whatever effects might be produced by the force of eloquence, in writing or speaking on the minds of our fellow-creatures, nothing but sterling truth, and inflexible facts, will serve us in the day of trial. If experience be not the foundation of any thing offered as a system; we surely have but little reason to flatter ourselves with any thing less than

“ That folly will the wretched work deface,
 “ And mock our fruitless labours with disgrace.”

On a review of the subject, I hope it will appear I have omitted nothing that would throw the least favourable light on Mr. Long's system at large, or any of its parts: am free to confess what I felt on reading his preliminary address; my mind went with him for a considerable time, and it was with reluctance that I found myself compelled to differ from him, not from him alone, but by his account from every one else that have been made acquainted with his principles; “ all having allowed the superiority of his system over “ that now in use.” I have with the most unprejudiced attention considered the whole, and lain as it were a kind of constraint on myself, and endeavoured

endeavoured to believe that if every body's judgment on this subject differed from mine, there was danger that mine might be formed on erroneous principles; and the better to set my mind right in this respect, I have called in the sentiments of others on some particular parts; and have to remark, that they as well as myself, look on the whole as fraught with extreme danger as to the quality of the beer; and appears to have no one advantage to recommend it, even supposing it were practicable to carry every part into execution.

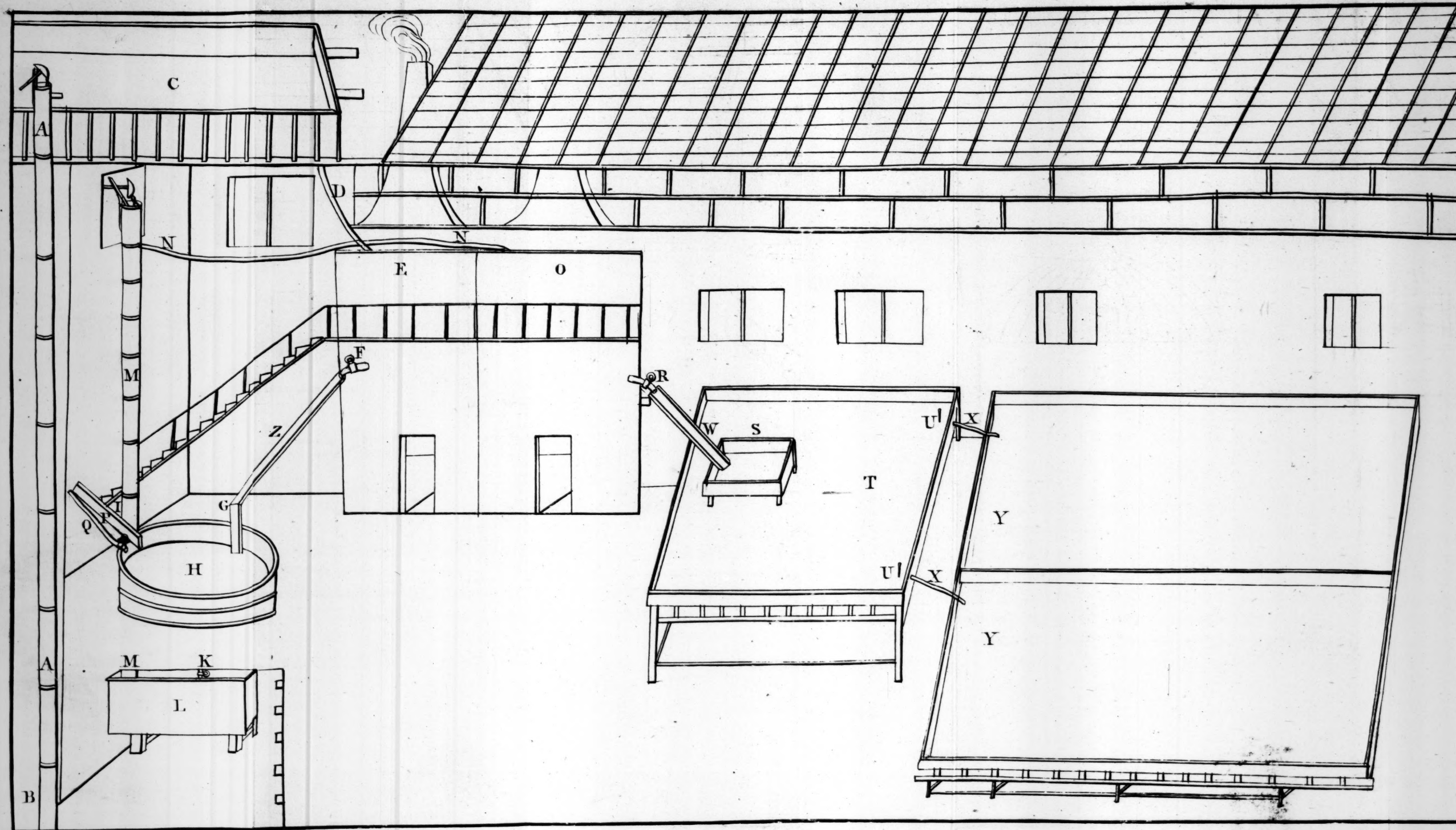
Dispatch is often of great consequence in his majesty's business; and surely it can never be admitted that any part of Mr. Long's mode or system, will come in for a preference on that account; the sending so large a quantity of wort from the cock of the mash tun, through the refrigerator, and setting aside the use of the underback, must necessarily take up a vast deal of time, more than the present mode, and call for a large quantity of water. The manner of making the extract from the hops, has nothing to recommend it; but on the contrary, I suspect that a very material injury will result therefrom to the flavour. The boiling the wort, only

15 or 20 minutes, can in no instance be deemed a sufficient time for separating from it that gross foul matter with which it is known to abound, and which boiling has a tendency to separate; thereby rendering the wort better prepared for a more intimate separation of its parts by fermentation. Cooling by refrigeration, I disapprove of, principally from an idea that the worts passing through so great a length of pipe, and in so foul a state, cannot but be materially injured.

Mr. Long's ideas of saving from the quality of the malt, by preventing the evaporation either in boiling, or cooling, are in my opinion ill founded, which my reader will readily admit, if he will be at the pains of making the experiment alluded to in page 29, which experiment might be said in a great measure to correspond with that made with a decoction of hops page 81; but notwithstanding the experiment with the hops seems to leave no room to doubt of a loss on that account, I confess myself to be not quite satisfied thereon, and shall ever be jealous of some trifling loss, and will endeavour to use every rational means to prevent it.

F I N I S.





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